

WORLDWIDE ROBOTICS SURVEY AND DIRECTORY



BEST AVAILABLE COPY



RIA *Worldwide Robotics Survey and Directory*

Material published in this survey and directory is derived from submissions by the organizations listed as survey respondents, (see table of contents). We assume no liability for any incorrect information which may be contained herein.

Published by the Robot Institute of America (RIA), P.O. Box 1366, Dearborn, MI 48121, (313) 271-0778. All rights reserved. Material may not be reproduced or photocopied in any form without written permission.

WHAT IS THE ROBOT INSTITUTE OF AMERICA? (RIA)

The Robot Institute of America is the only trade association in the United States involved in the field of robotics. Founded in 1974, RIA supports the exchange of technical information between robot manufacturers, distributors, corporate users, accessory equipment suppliers, consultants, systems houses and researchers. RIA membership currently includes more than 250 companies.

RIA members benefit from a variety of services geared to promote the acceptance of robotic technology. Unique meetings and workshops allow for one-to-one interaction between robot suppliers and users. RIA sponsorship of expositions and trade related seminars showcases the latest developments in robotics for worldwide audiences. The association also is involved in government and international affairs, formulating industry standards, marketing development activities and disseminating publications and industry position papers. As a result of these and related activities, RIA is known throughout the world for its leadership role in the robotics industry.

Table of Contents

	PAGE
1) INTRODUCTION	1
2) SURVEY TOPICS	
A. Worldwide Robot Population Charts	
1. World Robot Population Chart	1
2. Worldwide Population According to Type of Robot	2
3. Worldwide Population According to Applications	3
B. Projected Annual Production (1983-85 and 1990) and Monetary Value of Robots	4
C. Number of Robots Using Vision and Tactile Sensing	4
D. Price Range	5
E. Robot Standards Activities	5
3) JOINT VENTURES, MERGERS, AND SPECIAL AGREEMENTS	
A. 1982 U.S. Robotics Agreements Overseas	6
B. 1982 General Robotics Agreements	7
4) DIRECTORY	
A. Robot Manufacturers, Suppliers and Systems Houses	8-22
Australia	8
Austria	8
Belgium	8
Canada	8
Czechoslovakia	8-9
Denmark	9
Finland	9
France	9-11
Germany	11-12
Italy	12
Japan	12-15
Netherlands	15-16
Sweden	16
Switzerland	16
United Kingdom	16-19
United States	19-22
Yugoslavia	22
B. RIA Member Directory with Descriptions	
1. Robot Manufacturers, Distributors and Systems Houses	23-32
2. Accessory Equipment Suppliers	33-38
C. Survey Respondents	39-40



ROBOT DEFINITION*

"A Robot is a reprogrammable multi-functional manipulator designed to move material, parts, tools, or specialized devices, through variable programmed motions for the performance of a variety of tasks."

- Adopted by the Robot Institute of America, November 1979.
- Definition accepted by the International Coordinators at the 11th ISIR in Tokyo, Japan, October, 1981.

Introduction

Robots are no longer a concept for "futurists" — they are making significant contributions to today's manufacturing operations. One key to manufacturing profitability is flexibility, and robots are providing the flexibility required in the diversified world marketplace of the 1980's.

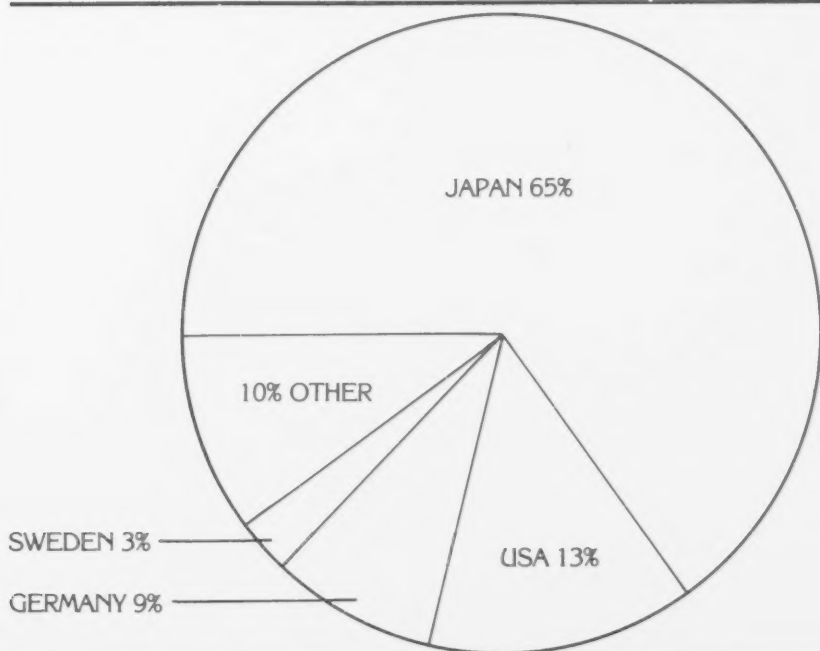
With the aid of robots, manufacturers are shortening changeover time, restoring order to work flow, producing higher quality products, increasing worker safety, reducing scrap and energy consumption, and creating an overall more efficient manufacturing process. In the future, even more significant gains are envisioned through the use of robots.

Because of the increasing importance of robot technology, many questions arise: "How many robot installations are operating today worldwide?" . . . "What types of applications are robots being used for?" . . . "What is projected for robots in the future?" To answer these and other pertinent questions, the International Coordinators requested that RIA survey countries around the world on a yearly basis.

The "1982 RIA Worldwide Robotics Survey and Directory" is a comprehensive study of 18 countries and their use of robots. Also included in this report is a directory of leading robot manufacturers, systems houses and distributors of robot equipment. The final section features a listing of the survey respondents.

On behalf of RIA, we would like to thank the respondents for their cooperation and time. It is with their help that we are able to supply this information.

World Robot Population Chart



Total number of operating robot installations
(not annual production), by the end of 1982.

CATEGORY:

- A. Reprogrammable, servo controlled point to point
- B. Reprogrammable, servo controlled continuous path
- C. Reprogrammable, non-servo controlled point to point

	Number of Robot Installations				*Total Monetary Value			
	A	B	C	Total	A	B	C	Total
Austria	5	20	25	50	301.000	1.6M	421.000	2.3M
Belgium	170	110	25	305	12.0M	9.0M	1.0M	22.0M
Canada	79	86	108	273	3.7M	6.6M	2.7M	13.0M
Czechoslovakia	76	18	60	154	NA	NA	NA	NA
Denmark	30	13	20	63	1.4M	600,000	600,000	2.6M
Finland	29	39	30	98	4.0M	3.2M	1.4M	8.6M
France	774	219	**9000	**9993	66.6M	21.9M	193.7M	282.2M
Germany	2450	1050	800	4300	122.0M	78.0M	13.0M	213.0M
Italy	500	200	400	1100	NA	NA	NA	NA
Japan	--18,650--		13,250	31,900	--841.0M--		256.0M	1.1B
Korea	8	0	2	10	96,000	0	8000	104,000
Netherlands	27	44	0	71	1.35M	2.64M	0	4.0M
Poland	105	165	15	285	NA	NA	NA	NA
Singapore	0	15	10	25	0	1.1M	400,000	1.5M
Sweden	435	175	840	1450	27.0M	8.3M	20.7M	56.0M
Switzerland	37	36	0	73	2.1M	2.6M	0	4.7M
United Kingdom	283	430	264	977	13.7M	36.0M	3.3M	53.0M
United States	3682	1071	1548	6301	265.0M	91.0M	35.0M	391.0M
Totals				**57,427				2.2B

* In 1982 U.S. dollars

** Includes 9000 variable sequenced manipulators

M = 1,000,000

B = 1,000,000,000

Estimate of robot population within each of the following applications, by the end of 1982

	Painting &			Casting	Material Handling	Machine Loading		Other	Total
	Welding	Finishing	Assembly			Unloading			
Austria	20			5	5	20			50
Belgium	219	22	4	2	10	34	14		305
Canada	88	40	43	39	43	17	3		273
Czechoslovakia	12	6	12	10	30	60	24		154
Denmark	12	13	8	20	0	8	2		63
Finland	30	29	0	11	9	14	5		98
France	*605	106	*3000	300	*4000	*500	*1482	**9993	
Germany	1916	417	122	120	587	193	945		4300
Italy	492	97	111	0	100	102	198		1100
Japan	8052	1071	6099	557	6797	2578	6746		31900
Korea	0	0	0	0	2	8	0		10
Netherlands	23	23	5	0	1	8	11		71
Poland	40	133	20	10	0	20	62		285
Singapore	4	6	0	0	5	10	0		25
Sweden	260	245	15	190	130	580	30		1450
Switzerland	25	0	26	0	0	20	2		73
United Kingdom	400	155	18	54	85	94	171		977
United States	2453	490	72	875	1300	1060	50		6300
Total	*14651	2853	*9555	2193	*13104	*5326	*9745	**57427	

* Includes variable sequenced manipulators

** Includes 9000 variable sequenced manipulators

Projected Annual Production and Monetary Value of Robots

	Projected Number Of Robots In The Year				*Monetary Value			
	1983	1984	1985	1990	1983	1984	1985	1990
Austria	80	130	150	NA	4.2M	7.4M	8.3M	NA
Canada	130	180	280	630	7.5M	10.5M	16.0M	33.0M
Czechoslovakia	220	54	800	1800	NA	NA	NA	NA
France	1380	1580	1820	4540	59.4M	68.3M	78.4M	195.4M
Germany	1800	2000	2300	3500	112.5M	125.0M	143.7M	219.0M
Italy	700	900	1200	5000	NA	NA	146.6M	586.0M
Japan	16200	17500	18800	34600	550.0M	598.0M	700.2M	1.3B
Netherlands	100	150	250	NA	4.6M	5.5M	8.0M	NA
Sweden	470	600	750	2400	16.5M	20.7M	24.8M	52.4M
United Kingdom	320	500	550	1500	13.0M	15.0M	19.0M	NA
United States	2400	3400	4500	24000	230.0M	305.0M	365.0M	2.0B
Totals	23800	26994	31400	77970	997.7M	1.16B	1.5B	4.4B

* In 1982 U.S. dollars M = 1,000,000 B = 1,000,000,000

NA = Not available

Amount of Robots That Incorporate The Following Capabilities

	Vision		Tactile Sensing		
	Simple	Real-Time	Force Feedback	Torque Sensors	Others
Belgium	0	0	2	1	0
Canada	9	2	7	10	0
Finland	20	0	2	0	0
France	0	55	3.....		
Germany	20	0	15	0	30
Italy	10	10	20.....		0
Japan			..*2,934..		
Poland	0	0	0	2	0
Sweden	50	3	15	10	0
Switzerland	19	0	7	0	0
United Kingdom	5	0	2	10	0
United States	37	18	30	10	60

* Figure combines vision and tactile sensing

**P*rice Range for Robots

Australia	10,000 - 150,000	Italy	117,280
Austria	24,080 - 120,400	Japan	17,080 - 76,860
Belgium	30,000 - 100,000	Netherlands	29,400 - 122,000
Canada	15,000 - 140,000	Poland	30,000 - 80,000
Czechoslovakia	14,000 - 130,000	Singapore	20,000 - 100,000
Denmark	7,200 - 60,000	Sweden	12,400 - 69,000
Finland	20,000 - 100,000	Switzerland	25,000 - 115,000
France	14,350 - 143,500	United Kingdom	16,175 - 130,000
Germany	16,000 - 133,000	United States	14,160 - 150,000

* In 1982 U.S. dollars

*R*obot Standards Worldwide

	Yes	No	Presently Working on Standards
Australia		X	
Austria		X	
Belgium		X	
Canada		X	
Czechoslovakia	X		
Finland		X	
France	X		
Denmark		X	
Germany	X		
Italy	X		
Japan	X		X
Korea		X	
Netherlands			X
Poland			X
Singapore			X
Sweden		X	
Switzerland		X	
United Kingdom			X
United States	X		X

Countries that have or are in the process of developing robot standards. This includes hardware, software and safety.

1982 *United States Robotics Agreements Overseas*

U.S. FIRMS	CONNECTIONS	TYPE OF AGREEMENT
Allegheny International	Sciaky S.A.	Licensing Agreement
American Robots	Rediffusion Simulation (U.K.)	Licensing Agreement
	Cyclomatic	OEM Agreement
	Cross Co.	End-User to Grow into OEM
Automatix	Jungheinrich (West Germany)	U.S. OEM & Licensing Agreements
Bendix	Yaskawa	OEM & Licensing Agreements
	Comau (Italy)	Licensing
	Toyota	OEM (Machine Tools)
Binks	Thermwood	Distributor of Thermwood robots
DeVilbiss	Trallfa (Norway)	Technical Exchange & Manufact. Licensing
GCA	Octek	Technical Licensing to Develop Interface (Vision)
	Autotrol	Technical Licensing to Develop Interface (CAD/CAM)
	Dainichi Kiko	Marketing Agreement
	WMI Robot Sys.	OEM Agreement
Nordson	Yaskawa	Marketing & Distribution Agreements
	Basfer (Italy)	Licensing Agreement
Prab Robots	Fabrique National Herstal S.A. (Belgium)	Licensing Agreement
	Can-Eng. Mfg. Ltd. (Canada)	Licensing Agreement
Ransburg	Renault	Joint Venture
	Tokico	Joint Venture (Hitachi owns 40% of Tokico; Tokico owns 33.5% of Ransburg Japan)
Robot Systems Inc.	IBM	Standard VAR Agreement
Thermwood	Cyclomatic	No longer active
	Binks	Marketing Agreement
	Didde Graphics	Private Labels
Unimation	Nokia (Finland)	Licensing Agreement
	Westinghouse	Buy Out
	Kawasaki	Licensing Agreement

OEM—Original Equipment Manufacturer
VAR—Value Added Remarketer Agreement

SOURCE: Prudential Bache

1982 General Robotics Agreements

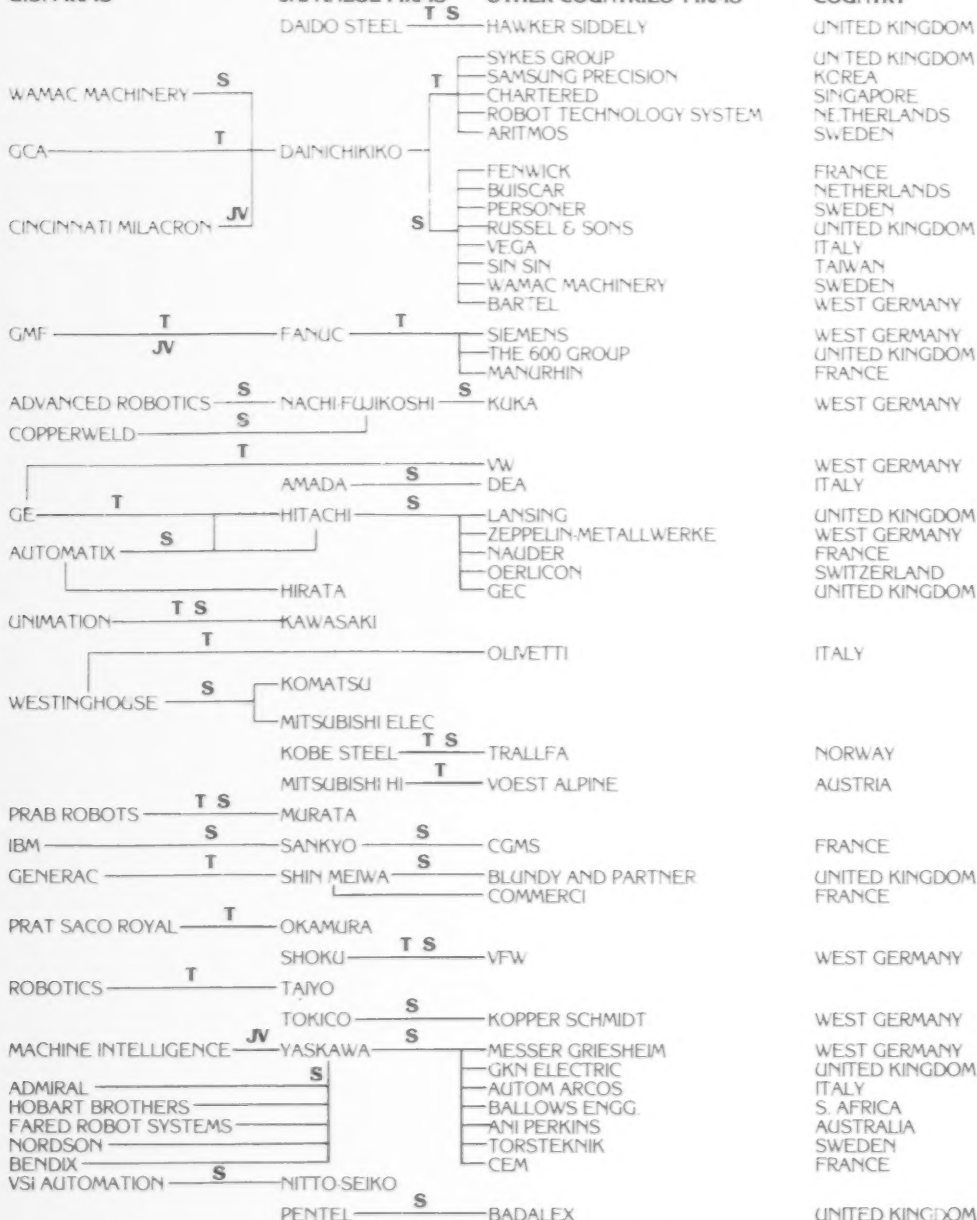
T - TECHNICAL LINKS
S - SALES LINKS
JV - JOINT VENTURE

U.S. FIRMS

JAPANESE FIRMS

OTHER COUNTRIES' FIRMS

COUNTRY



Source: Japan Industrial Robot Association (revised by Daiwa Securities America)

Robot Manufacturers, Suppliers and Systems Houses

AUSTRALIA

MACHINE DYNAMICS PTY. LTD.
852 Mountain Highway
Bayswater, Vic. 3153
Australia
Mr. L. Whelan

SPECIAL PURPOSE EQUIPMENT PTY. LTD.
P.O. Box 296
Woodville, 5011
South Australia
Mr. V. West

AUSTRIA

EPPLE BUXBAUM
Buxbaumstr. 1
A-4600 Wels
Austria

IGM
Industriezentrum no sud
A-2351 Wiener Neudorf
Austria

VOEST ALPINE
Finished Products Division
A-4020 Linz
Austria

BELGIUM

E.S. EUPEN
Rue Noereth 150
4700 EUPEN

DISTRIBEL
Rue Godin 33
4850 ENSIVAL

FN-INDUSTRIAL SYSTEMS
Ten Briele 2
8200 BRUGGE

FN-ROBOTICS S.A.
Shell Building
Ravenstein 60 - B20
1000 Brussels

WOIT & COTRICO S.A.
Rue du Compas 19
1070 BRUSSELS

CANADA

BLANAROVICH ENGINEERING
Box 65,
Don Mills, Ont., M3C 2R6

PROGRAMMABLE WELDING SYSTEMS
23 Lewis St.
Fort Erie, Ontario
(416) 871-2525, 871-4010
Telex: 061-5199

CZECHOSLOVAKIA

BAZ - BRATISLAVSKE AUTOMOBILLOVE
ZAVODY
891 41 Bratislava, Ruzova dolina 8
Tel. 673851-5

SKODA KONCERNOVY PODNIK
316 00 Plzen, nam. Ceskych bratru 8
Tel. 211

SLOVENSKA ARMATURKA, N. P.
907 16 Myjava
Tel. 2028

VIHORLAT, N. P.
069 01 Snina, Leninova ul. 80
Tel. 2366, 2277

VUKOV - VYSKUMNY USTAV
KOVOPRIEMYSLU
081 32 Presov, Sidlisko III.,
Vulgogradska ul.
Tel. 47672-3, 48351-5

VUMA - VYSKUMNY USTAV MECHANIZACIE
A AUTOMATIZACIE
915 28 Nove Mesto nad Vahom,
Piestanska ul.
Tel. 3441-7

ZEZ - ZAVODY ELEKTROTEPELNYCH
ZARIADENI
190 00 Praha 9, Medzitratova 650
Tel. 862841-3

ZPA - ZAVODY PRIEMYSELNEJ AUTO-
MATIZACIE
080 54 Presov, Budovatelska 38
Tel. 31785

CZECHOSLOVAKIA (Con't)

ZTS PODPOLIANSKE STROJARNE
962 13 Detva
Tel. 943 21

DENMARK

BJONTOFT & SON
Literbuen 17
2740 Skovlunde

FINLAND

ADAPTA OY
Siuntion kk.
SF-02570 SIUNTIO

AUTOMATION AND INDUSTRIAL
ROBOTS CO. LTD.
Varppeenaukio 3
SF-21200 RAISIO

NOKIA CORPORATION, ROBOTICS
P.O. Box 419
SF-00101
HELSINKI 10

W. ROSENLEW LTD. AUTOMATION
SF-28400 ULVILA

FRANCE

A.C.B. ATELIERS ET CHANTIERS
DE BRETAGNE
Robots Et Soudage Automatique
Prairie AU DUC
44040 Nantes Cedex
Mr. Argouarch
Directeur Section Robots
(40) 47.31.32

ACMA CRIBIER
3 A 15, Rue Denis Papin
95250 Beauchamp
Mr. Zirah
Directeur Du Departement
Robotique
(3) 413.54.90

A.K.R.-A.O.I.P. KREMLIN ROBOTIQUE
150, Avenue De Stalingrad
93240 Stains
Mr. Roger David
Directeur
(1) 821.61.12

ARDEX
Transpax
98, Avenue Du Noiret - BP 125
74301 Cluses Cedex
Mr. Michel Molliex
P.D.G.
(50) 98.01.80

AUTOMATISME EUROPEEN
160, Rue D'Authie 14000 Caen
Mr. Mouton
(31) 74.59.12

BERTIN ET CIE
Division Mechanismes Et Systemes
Industriels
Zone Industrielle - Bp 3
78370 Plaisir
Mr. B. De Junnemann
(3) 056.25.00

BILLAUD
27, Chemin De La Poterne - BP 732
38033 Grenoble Cedex
Mr. Jean Billaud
(76) 24.01.81

C.E.R.C.I. COMPAGNIE D'ETUDES ET
DE REALISATIONS DE CYBERNETIQUE
INDUSTRIELLE
56, Rue Roger Salengro - Peripole 103
94126 Fontenay Sous Bois Cedex
Mr. Lagarde
(1) 876.12.20

CLIMAX FRANCE COMPAIR
Division Automation
Rue De La Vallee Maillard - BP 717
41007 Blois Cedex
Mr. Alles
Directeur Du Departement Robots
Industriels
(54) 78.93.33

C.S.E.E. COMPAGNIE DE SIGNAUX
ET D'ENTREPRISES ELECTRIQUES
Andromat
17, Place Etienne Pernet
75738 Paris Cedex 15

DUBUIS
40, Rue Marceau
93108 Montreuil Cedex
Mr. Courtois
Directeur
(1) 859.51.84

DURAND ET LE MOLAIRE

Rue Des 3 Buches
26120 Malissard
Mr. Roger LeMolaire
Gerant
(75) 44.67.37

G2M LE PETIT

Departement Robotique
112-116, Rue G. Clemenceau
45500 Gien
Mr. Lecerf
Directeur Commercial
(38) 67.60.43

INADEX

26, Chemin Du Grand Buisson
25000 Besancon
Mr. Andre Blum
Directeur General
(81) 80.97.30

INDUSTRIA

28, Avenue Clara
94420 Le Plessis Trevis
Mr. Poirier
Directeur Technique
(1) 576.53.78

LA CALHENE

Direction Commerciale
Nucleaire
5, Avenue Emile Zola
95870 Bezons
Mr. Ludovic Ortman
Ingenieur Commercial
(3) 982.82.72

MEPAL

ZAI Du Bois De L'Epine
91015 Evry Cedex
Mr. Jacques Thibault
Gerant
(6) 077.11.12

MONTORNES S.A.

BP9
25260 Colombier-Fontaine
Mr. Herve Montornes
Directeur Technique
(81) 97.60.06

NAUDET

3, Avenue Du Colonel Jean
45800 Saint Jean De Braye
Mr. Naudet
Directeur
(38) 61.79.60

NEWMAT AUTOMATION

152, Boulevard Charles De Gaulle
95110 Sarinois
Mr. Roudaut
Gerant
(3) 981.02.37

PHAREMME

Le Moulin Des Vergnes
87379 Bersac
Mr. Serge Coussot
Gerant
(55) 71.44.11

**R.N.U.R. - REGIE NATIONALE DES
USINES RENAULT. D.O.D.M-SCE 992**

BP 103
92109 Boulogne Billancourt
Mr. Michel Tena
Directeur
(1) 609.81.60

**S.C.E.M.I. - SOCIETE DE CONSTRUCTION
ET D'EXPLOITATION DE MATERIELS
INDUSTRIELS**

61, Rue De Funas
38300 Bourgoin Jallieu
Mr. J. Pegoud
Responsable Commercial
(74) 93.20.04

SCIaky S.A.

119, Quai Jules Guesde
94400 Vitry S/Seine
Mr. Roland Cazes
Directeur Des Recherches
(1) 680.85.07

**SEPRO SOCIETE D'ETUDES ET DE
RECHERCHE DE PRODUITS**

44, Boulevard Des Etats Unis
85000 La Roche Sur Yon
Mr. Bernard Elineau
Directeur Commercial
(51) 05.51.59

**SORMEL SOCIETE D'ETUDES ET
REALISATIONS MECANIKES
ET ELECTRONIQUES**

Rue Becourel - BP 1565
25009 Besancon Cedex
Mr. Jean Berger
Directeur Technique
(81) 81.42.45

FRANCE (Con't)

SOUDURE AUTOGENE FRANCAISE

Groupe Robots
13 A 17, Rue D'Epluches
95310 Saint Ouen L'Aumone
Mr. Albert Combe
Directeur Division Auto-
matisation
(3) 464.92.80

SOUDURE ELECTRIQUE LANGUEPIN

8, Rue Proudhon
93214 La Plaine Saint Denis Cedex
Mr. Jean Raymond
Directeur
(1) 203.03.81

TECHIMATIC

116, Rue Du Vieux Pont De Sevres -
BP 46
92100 Boulogne Billancourt
Mr. Maugirard
Directeur Commercial
(1) 609.91.47

GERMANY (WEST)

ACMA CRIBIER

Z. HD. Herrn Prono
3 A 15, Rue Denis-Papin
F-95250 Beauchamp
Frankreich

AOIP KREMLIN ROBOTIQUE

150 Av. De Stalingrad
F-93240 Stains
Frankreich

CARL CLOOS SCHWEISSTECHNIK GMBH

Postfach 121
6342 Haiger

DUERR, WERK GEHOMAT

Robert-Bosch-Strasse 8
7141 Murr

FAB BILSING GMBH

Z. HD. Herrn Bilsing
AM Eckenbach 23
5952 Attendorn/Westf.

FIBRO GMBH WERK II

Postfach 1120
6954 Hassmersheim

GDA

Luetzelsteinerstr. 1
8000 Muenchen 45

GEBR. FELSS

Stein 2
7535 Koenigsbach

IGM INDUSTRIEGERAETE UND MASCHINENFABRIK GMBH

Z. HD. Frau Baumgartner
Strasse 2A, Halle M8
A-2351 WR. Neudorf
Oesterreich

IROBOS INDUSTRIEROBOTER SYSTEME GMBH

Hafenmarkt 10
8950 Kaufbeuren

IWKA KELLER & KNAPPICH (KUKA)

Z. HD. Herrn S. Mueller
Liebigstr. 22
8904 Friedberg

JUNGHEINRICH

Z. HD. Herrn Hansen
Friedrich-Ebert-Damm 129
2000 Hamburg 70

MBB-VFW (INDUSTRIEROBOTER)

Huenefeldstr. 1-5
2800 Bremen 1

NIMAK - M. A. G.

Z. HD. Herrn Vickel
Postfach 192
Werkstrasse
5248 Wissen/Sieg

NORDSON GMBH

Z. HD. Herrn Kripmann
Postfach 3048
Heinrich-Hertz-Str. 42
4006 Erkrath 1

OEW OTTENSENER EISENWERK

Z. HD. Herrn Friederichs
Steinwerder
2000 Hamburg 11

PFAFF INDUSTRIEMASCHINEN GMBH

Postfach 3020/3040
Koenigstr. 154
6750 Kaiserslautern

REIS GMBH & CO.

Z. HD. Herrn Reis
Postfach 1160
IM Weidig 1-4
8753 Obensburg

ROBERT BOSCH GMBH
Postfach 300220
Kruppstr. 1
7000 Stuttgart 30

SCEMI FILIALE DU GROUP CEM-BBC
38300 Bourgoin-Jallieu
Frankreich

STA STANDARD-HYDRAULIK GMBH
Z. HD. Herrn Heller
3251 Schmarrie

VOLKSWAGENWERK AG
Postfach
3180 Wolfsburg

ZAHNRADFABRIK FRIEDRICHSHAFFEN
AG

Z. HD. Herrn Rieder
Postfach 2520
Loewentaler Str. 100
7990 Friedrichshafen 1

ITALY

AISA
Via Roma 20
26020 Cumignano
SUL NVAIGLIO (Cremona)

ANSAIDO S.P.A.
Viale Sarca 338
20126 Milan

BASFER S.P.A.
Via Iseo 60
20052 Monza (Milan)

CAMEL ROBOTS S.R.L.
P.zza Addolorata 5
20030 Palazzolo
Milanese (Milan)

COMAU S.P.A.
Via Rivalta 30
10095 Grugliasco (Turin)

D.E.A. S.P.A.
Corso Torino 70
10024 Moncalieri (Turin)

DIPLOMATIC S.P.A.
Via Alba 18
21052 Busto Arsizio (Varese)

FATA-BISIACH & CARRU
Strada Statale 24, 12km
10044 Pianezza (Turin)

GAIOTTO IMPIANTI S.P.A.
Statak Milano-Crema km 27
26100 Vaiano Cremasco
(Cremona)

IMPERIAL PRIMA S.P.A.
Via Bologna 156
10100 Turin

JOBS S.P.A.
Via Marcollini 11
29100 Piacenza

NORDA S.P.A.
Via Vallecamonica 14/F
25100 Brescia

OLIVETTI OCN S.P.A.
Stradate Torino
10090 S. Bernardo Divrea (Turin)

PRIMA PROGETTI S.P.A.
Strada Carignano 48/2
10024 Moncalieri (Turin)

S.I.S-AUTOMAZIONE & ROBOT
INDUSTRIALI
via C Batiaal
21045 Gazzada (Varese)

SPERONI S.P.A.
27010 Scstegno Di
Spessa Po (Peria)

JAPAN

AIDA ENGINEERING, LTD.
2-10. Ohyamacho
Sagamihara City,
Kanagawa Pref. 229
(0427)72-5231

CITIZEN WATCH CO., LTD.
840 Shimotomi takeno
Tokoroawa City
Saitama-Pref 359
(0429)42-6271

DAIDO STEEL CO. LTD.
1-11-18, Nishiki
Naka-ku, Nagoya City
Aichi Pref. 460
(052)291-5111

DAIKIN KOGYO CO., LTD.
Shin-Hankyo Bldg.
1-12-39, Ummeda
Kita-ku, Osaka City 530
(06) 346-1201

JAPAN (Con't)

DAINICHI KIKO CO., LTD.
Kosai-Kogyo danchi, Kosai-cho
Nakakomagun Yamanashi Pref. 400-04
(05528)2-5581

FANUC LTD.
3-5-1, Asahigaoka, Hino City,
Tokyo 194
(0425)84-1111

FUJI ELECTRIC CO., LTD.
Shin-Yurakucho Bldg.
1-12-1, Yurakucho Chiyoda-ku
Tokyo 100
(03) 211-7111

FUJITSU LTD.
1015 Kamiodanaka Nakahara-ku
Kawasaki-City Kana gawa-Pref. 211
(044) 777-1111

HARMO LTD.
9057-2 Kohan Okaya-City
Nagano-Pref. 394
(02662)3-5818

HIKAWA INDUSTRY CO., LTD.
1-22-1 Futamuradai Toyoake-City
Aichi-Pref. 100
(05613)4-1611

HITACHI, LTD.
Hitachi Bldg., 6,
Kanda Surugadai 4 chome
Chiyoda-ku, Tokyo 101
(03)258-1111

ICHIKOH ENGINEERING, CO., LTD.
1297-3, Ninomiyacho Maebashi City
Gunma Pref. 379-21
(0272)68-2131

ISHIKAWAJIMA-HARIMA HEAVY
INDUSTRIES CO., LTD.
Shin-Ohtemachi
Bldg. 2-2-1, Ohtemachi
Chiyoda-ku, Tokyo 100
(03)244-6105

KANTOH CO., LTD.
2-7-2 Shimo Meguro,
Meguro-ku, Tokyo 153
(03)491-5191

KAWASAKI HEAVY INDUSTRIES, LTD.
World Trade Center Bldg.
2-4-1, Hamamatsucho,
Minato-ku, Tokyo 105
(03)435-2326

KAYABA INDUSTRY CO., LTD.
World Trade Center Bldg.,
2-4-1, Hamamatsucho,
Minato-ku, Tokyo 105
(03)435-6451

KITAMURA MACHINERY CO., LTD.
1870 Toide-cho, Takaoka-shi
Toyama Pref. 939-11
(0766)63-1100

KOBE STEEL, LTD.
1-3-18, Wakihamacho,
Fukiai-ku, Kobe City,
Hyogo Pref. 651
(078)251-1551

KOMATSU LTD.
2-3-6, Akasaka, Minato-ku
Tokyo 107
(03)584-7111

KOYO AUTOMATION SYSTEMS
1-26-3, Toyo Kohto-ku
Tokyo 135
(03)615-2611

KUROGANE CRANE CO., LTD.
60 Shiba-cho, Minami-ku,
Nagoya City, 457
(052)822-3211

KYORITSU ENGINEERING CO., LTD.
Miyado Bldg., 6-19, Hacyobori
Nakaku, Hiroshima City
Hiroshima Pref. 730
(0822)28-9747

KYOSHIN ELECTRIC CO., LTD.
6-20-7, Ikegami Ohta-ku,
Tokyo 146
(03)751-2131

MATSUSHITA ELECTRIC INDUSTRIAL
CO., LTD.
2-7 Matsuba-Cyo
Kadoma-City Osaka 571
(06)901-1171

MEIDENSHA ELECTRIC MFG. CO., LTD.
21-17, Osaki, Shinagawa-ku
Tokyo, 141
(03)492-1111

HR
MITSUBISHI ELECTRIC CORP.
2-2-3 Marunouchi, Chiyoda-ku,
Tokyo 100
(03)218-2164

MITSUBISHI HEAVY INDUSTRIES, LTD.
2-5-1, Marunouchi, Chiyoda-ku,
Tokyo 100
(03)212-3111

MITSUI ENGINEERING & SHIPBUILDING
CO., LTD.
5-6-4 Tsukiji, Chuo-ku,
Tokyo 104
(03)544-3455

MOTODA ELECTRONICS, CO., LTD.
4-32-9, Kamikitazawa, Setagaya-ku,
Tokyo 156
(03)303-8491

MURATA MACHINERY LTD.
3 Minamiochiai-cho Kishoin Minami-ku
Kyoto city, 601
(075)681-9141

NACHI-FUJIKOSHI CORP.
World Trade Center Bldg.
2-4-1, Hamamatsucho, Minato-ku,
Tokyo 105
(03)435-5036

NIPPON ELECTRIC CO., LTD.
5-33-1, Shiba, Minato-ku,
Tokyo 108
(03)454-1111

NIPPON ROBOT MACHINE CO., LTD.
73 Yoge, Nihongi-cho,
Anjo-City, Aichi Pref. 446
(0566)74-1101

NISAN DENKI CO., LTD.
3-35-2, Nishikoujiya Ohta-ku
Tokyo 144
(03)743-0201

O-A MACHINERY CORP.
Shinkyo Shoji Bldg.
14-chome, Kojimachi,
Chiyoda-ku, Tokyo 102
(03)265-4461

OKAMURA CORP.
1-4-1, Nitako, Nishi-ku,
Yokohama City,
Kanagawa-Pref. 210
(045)319-3401

OKI ELECTRIC INDUSTRIES CO., LTD.
1-7-12, Toranomom, Minato-ku
Tokyo 105
(03)501-3111

OMRON TATEISI ELECTRONICS CO.
Igadera Shimokaiinji
Nagaokakyo City Kyoto 617
(075)921-5111

ORII CORP.
6 Suzukawa, Isehara City
Kanagawa Pref. 259-11
(0463)93-0811

OSAKA TRANSFORMER CO., LTD.
2-1-11, Tagawa Yodogawa-ku
Osaka City 532
(06)301-1212

OTARU SEISAKUSHO CO., LTD.
3-162 Zenibako Otaru-City 047-02
(0134)62-5252

PENTEL CO., LTD.
4-1-8 Yoshi-cho, Soka City
Saitama Pref. 340
(0489)22-1111

SANKI ENGINEERING CO., LTD.
Sanshin Bldg
1-4-1, Yurakucho
Chiyodo, ku, Tokyo 100
(03)502-6111

SANKYO SEIKI MFG CO., LTD.
1-17-2, Shinbashi, Minato-ku,
Tokyo 105
(03)508-1156

SEIBU ELECTRIC MFG CO., LTD.
868-1 Kubo Kogamachi,
Kasuya-gun Fukuoka-Pref. 811-31
(09294)3-7071

SHINKO ELECTRIC CO., LTD.
Asahi Bldg., 3-12-2 Nihonbashi,
Chuo-ku, Tokyo 103
(03)274-1111

SHINMEIWA INDUSTRY CO., LTD.
1-1, Shinmeiwacho, Takarazuka City,
Hyogo Pref. 665
(0798)52-1234

SHOKU CORP.
3-14-1, Nihonbashi, Chuo-ku,
Tokyo 103
(03)281-1231

JAPAN (Con't)

STAR SEIKI CO., LTD.
2-36, Sakamachi, mizuho-ku,
Nagoya City, Aichi Pref. 467
(052)881-2817

SUMITOMO ELECTRIC INDUSTRIES LTD.
1-1-3, Shimaya Konohana-ku,
Osaka City, 554
(06)461-1031

SUMITOMO HEAVY INDUSTRIES CO., LTD.
Shin-Otemachi Bldg.
2-2-1, Ohtemachi Chiyoda-ku,
Tokyo 100
(03)243-0561

TAIYO, LTD.
48 Kita-Eguchicho, Higashi-Yodogawa-
ku, Osaka 533
(06)340-1111

THE JAPAN STEEL WORKS LTD.
Hibiya Mitsui Bldg. 1-2 Yurakucho
1-chome, Chiyoda-ku, Tokyo 100
(03)501-6111

TOEI ELECTRIC CO., LTD.
Keikyū Bldg., 2-21-28,
Takanawa minato-ku, Tokyo 108
(03)442-8300

TOKICO, LTD.
1-6-3, Fujimi, Kawasaki-ku,
Kawasaki City, Kanagawa Pref. 210
(044)244-3111

TOKYO SHIBAURA ELECTRIC CO., LTD.
1-1-6, Uchi-Saiwaicho,
Chiyoda-ku, Tokyo 100
(03)454-7111

TOSHIBA SEIKI CO., LTD.
5-14-33, Higashi-Kashiwagaya,
Ebina City, Kanagawa Pref. 243
(0462)31-8111

TOYODA MACHINE WORKS, LTD.
1-1, Asahicho, Kanya City,
Aichi Pref. 448
(0566)22-2211

YASKAWA ELECTRIC MFG. CO., LTD.
Ohtemachi Bldg., 1-6-1, Ohtemachi,
Chiyoda-ku, Tokyo 100
(03)217-4111

NETHERLANDS

BROWN BOVERI BV
P.O. Box 301
3000 AH Rotterdam
Tel. (010) 180280
Telex 21539 BBC NL

C.C.M.
Duivendijk 7
5672 AD Nuenen
Tel. (040) 834405
Telex 51890

EAL (APELDOORN) BV
Dijkgraafweg 16
7336 AT Apeldoorn
Tel. (055) 339181
Telex 36331

HIGH TECHNOLOGY HOLLAND BV
Herman Kruidersstraat 4
5645 KD Eindhoven
Tel. (040) 115741
Telex 120010 PMS NL

INELCO BV
Turfstekerstraat 63
1431 GD Aalsmeer
Tel. (02977) 28855
Telex 14693

INGENIEURSBUREAU KERS BV
Zuiderklamp 85
5672 HB Nuenen
Tel. (040) 835630

NIJCKER ELEKTRONIKA BV
Drentestraat 7
1083 HK Amsterdam
Tel. (020) 462221
Telex: 11625 Nesco

PMB PATENT MACHINEBOUW
Kanaaldijk 5
5683 CR Best
Tel. (04998) 74060
Telex: 51299

RTS ROBOT TECHNOLOGICAL SYSTEMS
Ruti te Strake BV
Dr. Huub van Doorneweg 26
P.O. Box 6
5750 AA Deurne
Tel. (04930) 18225
Telex: 51354

SUPERIOR ELECTRIC NEDERLAND BV
Koperwerf 33
2544 EM The Hague
Tel. (070) 679590
Telex: 31436

SWEDEN

ASEA AB
Department YBF
S-721 83 Vasteras
Tel: 021-10 50 96

ASEA AB
Division Industrial Robots
Department Material Handling
Systems
Fagelviksvagen 3
S-145-53 Norsborg
Tel: 0753-891 00

ATLAS COPCO TOOLS AB
Box 815 10
S-104 82 Stockholm
Tel: 08-44 99 20

EKSTROMS INDUSTRI
Box 73
S-564 01 Bankeryd
Tel: 036-725 35

KAUFELDT AB
Box 42 139
S-126 12 Stockholm
Tel: 08-19 03 55

SWITZERLAND

MICROBO
rue Beauregrad 3,
2035 Corcelles, Suisse
Telex: 35 595

UNITED KINGDOM

AIRSTEAD INDUSTRIAL SYSTEMS LTD.
New England House,
New England Street,
Brighton, BN1 4GH
Tel: 0273 606918

ARO MACHINERY CO. LTD.
190 Castelnau,
London, SW13 9DJ
Tel: 01 748 5434

ASEA LTD.
25 Alston Drive,
Bradwell Abbey,
Milton Keynes
Tel: 0908 319666

BINKS-BULLOWS LTD.
Pelsall Road,
Brownhills,
Walsall,
West Midlands, WS8 7HW
Tel: 05433 2571

BRITISH FEDERAL WELDER AND
MACHINE CO. LTD.
Castle Mill Works,
Dudley,
West Midlands, DY1 4DA
Tel: 0384 54701

BRITISH OERLIKON,
Anthony House,
Birmingham Road,
Stratford-upon-Avon, CV37 0AJ
Tel: 0789 66894

CINCINNATI MILACRON LTD.
Industrial Robot Divn.,
Caxton Road,
Bedford, MK41 0HT
Tel: 0234 45221

COLNE ROBOTICS LTD.
1 Station Road,
Twickenham,
Middlesex, TW1 4LL
Tel: 01 892 7044

DAINICHI SYKES ROBOTICS LTD.
Unit 91,
Walton Summit Centre,
Bamber Bridge,
Preston,
Lancs., PR5 8AE
Tel: 0772 322444

DEVILBISS CO. LTD.
Ringwood Road,
Bournemouth.
Tel: 02016 71111

ESAB LTD.
Beechings Way,
Gillingham,
Kent, ME8 6PU
Tel: 0634 34456

UNITED KINGDOM (Con't)

FAIREY AUTOMATION LTD.,
Techno Trading Estate,
Bramble Road,
Swindon,
Wilshire, SN2 6HB.
Tel: 0793 481161/2

FIBROTAKT (UK) LTD.,
3-6 The Colonnade,
High Street,
Maidenhead,
Berks, SL6 1QL
Tel: .0628 30050

FRASER-NASH GROUP LTD.,
Vine House,
143 London Road,
Kingston-upon-Thames,
Surrey, KT2 6NH.
Tel: 01 549 9412

GKN LINCOLN ELECTRIC LTD.,
Black Fan Road,
Welwyn Garden City,
Herts, AL7 1QA
Tel: 07073 24581

GRUNDY & PARTNERS LTD.
Bonds Mill,
Stonehouse,
Glos., GL10 3RG
Tel: 045 382 3611

HADEN DRYSYS LTD.,
Alliance Road,
Acton,
London W3 0RA
Tel: 01 992 1116

HALL AUTOMATION LTD.
Broughton Road,
Rugby,
Warwickshire, CV21 1BU.
Tel: 0788 2144

HARMO ROBOTS LTD.,
P.O. Box 20,
Welwyn Garden City,
Herts., AL7 4SF
Tel: 07073 32121

HAYNES AND FORDHAM
Unit 1,
Spring Field Industrial Estate,
Farley,
Leeds,
West Yorkshire, LS28 7UT.
Tel: .0532 55275

HEAD WRIGHTSON MACHINE CO. LTD.
Durham Street,
Middlesbrough
Cleveland, TS2 1PN.
Tel: 0642 241155

HYDRO MACHINE TOOLS LTD.,
Colchester Road,
Halstead,
Essex, C09 2EU.
Tel: 07874 75121

KOCKUMS INDUSTRIES LTD.
Boyn Valley Industrial Estate,
Maidenhead,
Berks, SL6 4EH
Tel: 0628 39944

KREMLIN SPRAY PAINTING EQUIPMENT
LTD.
839 Yeovil Road,
Slough,
Berks., SL1 4JA.
Tel: 0753 38143/5

G. KUUKKA LTD.,
Hill Farm Avenue
Leavesden,
Watford,
Herts., WD2 7BL.
Tel: 09273 70611

KUKA (UK) LTD.
7 Union Street,
Bedford.
Tel: 0234 212546

LAMBERTON ROBOTICS LTD.,
26 Gartsherrie Road,
Coatbridge,
Strathclyde, ML5 2DL.
Tel: 0236 26177

P.N. LANGMEAD LTD.
Enterprise House,
Ashford Road,
Ashford,
Middlesex.
Tel: 07842 46901

LANSING INDUSTRIAL ROBOTS,
Kingsclere Road,
Basingstoke,
Hants.
Tel: 0256 3131

MARWIN AUTOMATION LTD.
Waddens Brook,
Wednesfield,
Wolverhampton, WV11 3SS.
Tel: 0902 65363

MILLS MARKETING SERVICES LTD.
Javelin Road,
Norwich Airport Industrial Estate,
Norwich, NR6 6NX.
Tel: 0603 46603

MOULDMATION LTD.
Bryant Street,
Winson Green,
Birmingham B18 4BH
Tel: 021 523 6669

NEWTOL LTD.,
Industrial Estate, ,
Fakenham,
Norfolk, NR21 8NJ.
Tel: 0328 3150

NORDSON (UK) LTD.,
Ashurst Drive,
Cheadle Heath,
Stockport,
Cheshire, SK3 0RY.
Tel: 061 491 2882

OLIVETTI LTD.,
Numerical Control Divn.,
105-107 Watling Street,
Bletchley,
Milton Keynes.
Tel: 0908 71155

PENDAR TECHNICAL ASSOCIATES LTD.,
Unit 13,
Hamp Industrial Estate
Old Taunton Road,
Bridgewater,
Somerset, TA6 3NT.
Tel: 0278 56888

PERA,
Melton Mowbray,
Leicestershire, LE13 0PB.
Tel: 0664 64133

PRESSFLOW LIMITED,
29 Planetary Road,
Willenhall,
West Midlands, WV13 3RT.
Tel: 0902 726671

REMEK ELECTRONICS LTD.,
Barton Road,
Water Eaton Industrial Estate,
Bletchley,
Milton Keynes, MK2 3HY.
Tel: 0908 649494

RINGWAY POWRE SYSTEMS LTD.,
Churchill House,
Tablot Road,
Old Trafford,
Manchester, M16 0PD
Tel: 061 872 6829

ROBOSEMBLY,
(Division of Rotawinder Ltd.),
Forest Road,
Hainault,
Ilford,
Essex, IG6 3HJ
Tel: 01 501 0921

S. RUSSELL & SONS,
Bath Lane,
Leicester, LE3 5BB.
Tel: 0533 23711

SCIAKY ELECTRIC WELDING M/C LTD.,
212 Bedford Avenue,
Slough.
Berkshire, SL1 4RH.
Tel: 0753 25551

SYKE INSTRUMENTATION LTD.,
117-119 Station Road,
Liss,
Hampshire.
Tel: 073082 3821

SYSTEMS CONTROL,
30 Thirsk Road,
Northallerton,
North Yorkshire, DL6 1PH
Tel: 0609 70643

TAYLOR HITEC LTD.,
77 Lyons Lane,
Chorley,
Lancs., PR6 0PB
Tel: 025 72 5825

UNITED KINGDOM (Con't)

TELEHOIST LTD.,
Manor Road,
Cheltenham,
Glos., GL51 9SH.
Tel: 0242 21355

TRH GRAPHICS LTD.,
66 King Street,
Southall,
Middlesex, UB2 4DD.
Tel: 01 571 2116

UNIMATION (EUROPE) LTD.
Unit C.
Stafford Park 8,
Telford,
Shropshire, TF3 3AX.
Tel: 0952 618931

UNITED STATES

***Denotes RIA Membership as of
December, 1982**

(See page 23 for RIA
Members' Product Descriptions)

ACCUMATIC MACHINERY CORP.
3537 Hill Ave.
Toledo, OH 43607
Tel: 419/535-7997

ADVANCED ROBOTICS CORP.*
777 Manor Park Drive
P.O. Box 28399
Columbus, OH 43228
Tel: 614/870-7778

AMERICAN CAN COMPANY
Automated Handling Systems
1 Pearl Court
Allendale, NJ 07401
Tel: 201/934-9200

AMERICAN ROBOT CORP.*
121 Industry Drive
Pittsburgh, PA 15275
Tel: 412/787-3000

A.O. SMITH CORP.*
Programmed Mfg. Sys. Div.
N114 W18850 Clinton Drive
P.O. Box 69
Germantown, WI 53022
Tel: 414/251-2850

ARMAX ROBOTICS, INC.*
38700 Grand River Ave.
Farmington Hills, MI 48018
Tel: 313/477-3900
Telex: 22-9417

ASEA INC.*
16250 W. Glendale
New Berlin, WI 53151
Tel: 414/785-3400
Telex: 230419

AUTOMATIX INC.*
1000 Tech Park Drive
Billerica, MA 01821
Tel: 617/667-7900
Telex: 95-1518

AUTOMATON CORP.
12763 Stark Road
Suite 111
Livonia, MI 48150
Tel: 313/427-4420

BENDIX ROBOTICS
Bendix Center
Southfield, MI 48034
Tel: 313/827-5354
Telex: 23 0699

BINKS
9201 W. Belmont
Franklin Park, IL 60131
Tel: 312/671-3000

CAMCO
Commercial Cam Division
Emerson Electric Co.
1444 S. Wolf Road
Wheeling, IL 60090
Tel: 312/459-5200

CINCINNATI MILACRON INC.*
215 S. West Street
Lebanon, OH 45036
Tel: 513/932-4400

COMET WELDING SYSTEMS
880 Nicholas Blvd.
Elk Grove Village, IL 60007
Tel: 312/956-0126
Telex: 910-222-0192

CONTROL AUTOMATION INC.*
Clarksville & Everett Rd.
P.O. Box 2304
Princeton, NJ 08540
Tel: 609/799-6026

COPPERWELD ROBOTICS, INC.*
1401 East 14 Mile Road
Troy, MI 48084
Tel: 313/585-5972
Telex: TWX 810-232-4130

CYBOTECH, INC.*
Division of Ransburg Corp.
P.O. Box 88514
Indianapolis, IN 46208
Tel: 317/298-5000
Telex: 27464

CYCLOMATIC INDUSTRIES INC.
7520 Convoy Ct.
San Diego, CA 92111
Tel: 714/292-7440

DEVILBISS COMPANY*
Industrial Robot Operations
837 Airport Blvd.
Ann Arbor, MI 48104
Tel: 313/668-6765

ESAB NORTH AMERICA, INC.*
Robotic Welding Div.
1941 Heath Pkwy.
P.O. Box 2286
Fort Collins, CO 80522
Tel: 303/484-1244

EXPERT AUTOMATION INC.*
40675 Mound Road
Sterling Heights, MI 48078
Tel: 313/977-0100

FARED ROBOT SYSTEMS, INC.*
3860 Revere Street, Suite D
P.O. Box 39268
Denver, CO 80239
Tel: 303/371-5868

FLEXIMATION SYSTEMS CORP. (TOSHIBA)
53 Second Ave.
Burlington, MA 01803
Tel: 617/229-6670

GALLAHER ENTERPRISES, INC.
4310 Enterprise Drive
P.O. Box 10244
Winston-Salem, NC 27108
Tel: 919/725-8494

GCA CORP.*
1 Energy Center
Naperville, IL 60566
Tel: 312/369-2110

GENERAL ELECTRIC COMPANY*
Automation Systems
P.O. Box 17500
Orlando, FL 32860-7500
Tel: 305/886-2200

GMFANUC ROBOTICS CORP.*
Northfield Hills Corp. Center
5600 New King Street
Troy, MI 48098
Tel: 313/492-0897

GRACO ROBOTICS INC.
12898 Westmore Ave.
Livonia, MI 48150
Tel: 313/523-6300

HITACHI AMERICA LTD.*
Industrial Components Sales
and Service
59 Route 17 South
Allendale, NJ 07401
Tel: 201/825-8000

HOBART BROTHERS CO.
Advanced Welding Tech. Grp.
600 W. Main Street
Troy, OH 45373
Tel: 513/339-6011

IBM CORPORATION*
Advanced Mfg. Systems Dept.
IRD Division
2000 N.W. 51st Street
P.O. Box 1328
Boca Raton, FL 33432
Tel: 305/994-2979

IKEGAI AMERICA CORP.
770 West Algonquin Rd.
Arlington Heights, IL 60005
Tel: 312/437-1488

INOLL ROBOTIC SYSTEMS*
349 W. Lancaster Ave.
P.O. Box 496
Haverford, PA 19041
Tel: 215/642-4144

INTERNATIONAL ROBOMATION/
INTELLIGENCE
6353 El Camino Road
Carlsbad, CA 92008
Tel: 714/438-4424

UNITED STATES (Cont'd)

ISI MANUFACTURING, INC.
31915 Groesbeck Hwy.
P.O. Box 220
Fraser, MI 48026
Tel: 313/294-9500

JERVIS B. WEBB COMPANY*
Webb Drive
Farmington Hills, MI 48018
Tel: 313/553-1000

F. JOSEPH LAMB COMPANY
5663 E. 9 Mile Road
Warren, MI 48091
Tel: 313/536-3535

KOHOL SYSTEMS, INC.*
980 Senate Drive
Dayton, OH 45459
Tel: 513/439-5200

LAMSON CORP.
P.O. Box 4857
Syracuse, NY 13221
Tel: 315/432-5500

LIVERNOIS AUTOMATION COMPANY
25315 Kean
Dearborn, MI 48124
Tel: 313/278-0200

MACHINE INTELLIGENCE CORP.*
330 Potrero Ave.
Sunnyvale, CA 95051
Tel: 408/737-7960

MACK CORPORATION*
3695 E. Industrial Drive
P.O. Box 1756
Flagstaff, AZ 86002
Tel: 602/526-1120

MANCA INC.
24 Link Drive
Rockleigh, NJ 07647
Tel: 201/767-1100

MICROBOT*
453-H Ravendale Drive
Mountain View, CA 94043
Tel: 415/968-8911

MOBOT CORPORATION*
980 Buenos Ave.
Suite A
San Diego, CA 92110
Tel: 714/275-4300

MTS SYSTEMS CORP.*
Ind. Systems Div.
P.O. Box 24012
Minneapolis, MN 55424
Tel: 612/937-4080

NORDSON CORPORATION*
Robotics Division
4937 Mills Industrial Pkwy.
North Ridgeville, OH 44039
Tel: 216/988-9411

NOVA ROBOTICS*
262 Prestige Park Road
East Hartford, CT 06108
Tel: 203/528-9861

OCTEK INC.
7 Corporate Place
South Bedford St.
Burlington, MA 01803
Tel: 617/273-0851

PENTAL OF AMERICA LTD.
2715 Columbia Street
Torrance, CA 90503
Tel: 213/320-3831

PICK-O-MATIC SYSTEMS
37950 Commerce Drive
P.O. Box 820
Sterling Heights, MI 48077
Tel: 313/939-9320
Telex: 235612

POSITECH CORP.
Ruch Lake Road
Laureus, IA 50554
Tel: 712/845-4548

PRAB ROBOTS, INC.*
6007 Sprinkle Road
Kalamazoo, MI 49003
Tel: 616/329-0835

PRODUCTIVITY SYSTEMS, INC.*
21999 Farmington Road
Farmington, MI 48024
Tel: 313/474-5454

REIS MACHINES*
1426 Davis Road
Elgin, IL 60120
Tel: 312/741-9500

ROBOMATION SYSTEMS
P.O. Box 652
Madison Heights, MI 48071
Tel: 313/699-1930

ROBOT SYSTEMS, INC.*
110 Technology Parkway
Technology Parkway
Technology Park/Atlanta
Norcross, GA 30092
Tel: 404/448-6700

SANDHU MACHINE DESIGN INC.
308 South State
P.O. Box 4010
Champaign, IL 61820
Tel: 217/352-8485

SCHRADER BELLOWS
Div. of Schovill, Inc.
200 W. Exchange St.
Akron, OH 44309
Tel: 216/375-5202

SEIKO INSTRUMENTS, INC.*
2990 W. Lomita Blvd.
Torrance, CA 90505
Tel: 213/530-3400

SIGMA
6505 C. Serrano Ave.
Anaheim, CA 92807
Tel: 714/974-0166

SORMEL/BLACK & WEBSTER
281 Winter Street
Waltham, MA 02254
Tel: 617/890-9100

STERLING DETROIT COMPANY*
261 Goldengate Ave.
Detroit, MI 48203
Tel: 313/366-3500

TECQUIPMENT INC.
P.O. Box 1074
Action, MA 01720
Tel: 617/263-1767

THERMWOOD CORPORATION*
P.O. Box 436
Dale, IN 47523
Tel: 812/937-4476

TOWA CORPORATION OF AMERICA*
1711 S. Pennsylvania Ave.
Morrisville, PA 19067
Tel: 215/295-8103

UNIMATION INC.*
Shelter Rock Lane
Danbury, CT 06810
Tel: 203/744-1800

UNITED STATES ROBOTS*
650 Park Avenue
King of Prussia, PA 19406
Tel: 215/768-9210

UNITED TECHNOLOGIES CORP.*
Automotive Group
5200 Auto Club Drive
Dearborn, MI 48126
Tel: 313/593-9616

UNIVERSAL INSTRUMENTS CORP.*
Product Development
P.O. Box 825
Binghamton, NY 13902
Tel: 607/775-1102

WEAR CONTROL TECHNOLOGY, INC.*
189-15 Station Road
Flushing, NY 11358
Tel: 212/762-4040

YASKAWA ELECTRIC AMERICA, INC.
305 Era Drive
Northbrook, IL 60062
Tel: 312/564-0770

YUGOSLAVIA

Ivo Lola
IVO LOLA RIBAR
Tool Machine Factory
11250 Zelexnix
Telex: 11276

PRVA PETROLETKA
Ro Aloden
37240 Trstenik
Telex: 11427

TELEOPTIK
Oour Alati
11080 Semun
Telex: 12346

TGO GORENJE
63320 Velenje
Telex: 33547

Special Directory of RIA Members. Services And Product Descriptions

RIA ROBOT MANUFACTURERS, DISTRIBUTORS & SYSTEMS HOUSES:

ADVANCED ROBOTICS CORPORATION
777 Manor Park Drive
P.O. Box 28399
Columbus, OH 43228
Tel: 614/870-7778
Contact Person: Ronald C. Reeve, Jr.
Chairman

Product line includes 3 distinctive models of all-electric, high technology industrial robots. Cyro 820 is an articulated robot; Cyro 750 and 2000 are rectilinear robots. Company services provide for sales of complete robotic installations—including robot, positioning robot, process application equipment, tooling, training, (both programming and maintenance) for a complete, turn-key robot installation. Robots include unique control features which aid in both on and off-line programming, along with built-in programming aids to simplify programming process application parameters.

AMERICAN ROBOT CORPORATION
121 Industry Drive
Pittsburgh, PA 15275
Tel: 412/787-3000
Telex: 812401 AMEROBOT CORA
Contact Person: Romesh Wadwani
President

American Robot Corporation designs and manufactures the MERLIN series of robots and robotic flexible manufacturing systems for a wide range of applications: high-precision assembly, materials handling, inspection, arc welding, etc. MERLIN's U.S.-developed proprietary robot technology is also available to licensees in the U.S. and overseas (except in the U.K. and Japan where it is already licensed).

A.O. SMITH CORPORATION
Programmed Manufacturing
Systems Division
N114 W18850 Clinton Drive • P.O. Box 69
Germantown, WI 53022
Tel: 414/251-2850 • Telex: 53022 0069
Contact Person: C. J. Tur
Division Manager

The A.O. Smith Corporation's Programmed Manufacturing Systems Division provides full systems capability and follow-up support, regardless of the type of robot selected. 1) PMSD begins with the survey of the facility, 2) a total turn-key robotic system can be designed and supplied that will perform the required functions, 3) supervision of installation of system at customer's location, and 4) training of customer personnel in complete operation and maintenance of the robotic systems.

ARMAX ROBOTICS INC.
38700 Grand River Avenue
Farmington Hills, MI 48018
Tel: 313/477-3900
Contact Person: Charles J. Drake
Vice President

ARMAX manufactures and markets a line of hydraulically powered servo and non-servo robots with a payload of 150 pounds. ARMAX robots are modular in design with capability for up to 9 axis and 144 user I/O. ARMAX controls use a human factor styled design which walks the user through programming tasks using "plain English." ARMAX has the capability of total turn-key automation systems including design, manufacturing and installation of handling systems, welding systems and robots.

ASEA, INC.
16250 W. Glendale
New Berlin, WI 53151
Tel: 414/785-3400
Telex: 230419
Contact Person: Y. Gustafsson
Consultant to the President

ASEA Inc. manufactures and markets a

complete line of robots. The IRb-6 and the IRb-60 are all-electric drive robots of the revolute configuration. The mini computer control system has a memory capacity of 250 positions (expandable for up to 500 positions). ASEA also manufactures and markets the MHU (material handling units) line of industrial robots. These are the MHU Senior 415, the MHU Junior 305 and the MHU Minor 301.

AUTOMATIX INC.
1000 Tech Park Drive
Billerica, MA 01821
Tel: 617-667-7900
Telex: 95-1518
Contact Person: Philippe Villers
President

Automatix designs and manufactures turn-key robotic systems.

Productions include: Robovision II Arc Welding Systems, with or without seam-tracking; Autovision II Artificial Vision Systems for quality inspection and robot guidance; and Cybervision III Robotic Assembly and Manufacturing Control Systems, with or without vision. Cybervision III is used for precision assembly or welding.

Robovision, Autovision, and Cybervision are trademarks of Automatix Inc.

CINCINNATI MILACRON
215 S. West Street
Lebanon, OH 45036
Tel: 513/932-4400
Contact Person: Michael Radeke
Vice President & General Manager

Robot Line:	Application
T3 566	
—Hydraulic	Welding—spot and arc
T3 586	
—6 Axes—Articulated Arm	Material—handling
—Controlled path motion	machine load pick and place
—Weight: 100 to 225 lbs.	process drill
—50 lbs speed (566)	de-burr
—2 SIPS speed (586)	

T3726	
—Electric	Welding—Arc
T3 74	
—6 Axes—articulated arm (includes 3 roll wrist)	Material Handling—Machine Load pick and place process—
—Controlled path motion	Drill
—Weight: 15 to 90 lbs.	de-burr
—Speed: 40 IPS	

CONTROL AUTOMATION, INC.
Clarksville & Everett Road
P.O. Box 2304
Princeton, NJ 08540
Tel: 609/799-6026
Contact Person: Gordon I. Robertson
President

Control Automation is the source of quality smart automation. Our initial offerings are a Single Arm Cartesian Coordinate Robot (able to add two additional arms) and a profile recognition-type Vision System. These systems are plug compatible with each other and the outside world via standard RS 232 communications. The systems are hierarchical in nature to allow for ease of implementation in any customer production network.

Control Automation offers field service, applications and full product training.

COPPERWELD ROBOTICS
1401 E. 14 Mile Road
Troy, MI 48064
Tel: 313/585-5972
Telex: TWX 8102324130
Contact Person: Robert L. King
Marketing Director-Sales

Copperweld Robotics offers the experience, the products, the facilities, and the talent to ensure the success of your robotic system installations.

Our product line includes:

CR100—Pneumatic-electric cartesian coordinate robot specifically designed for assembly tasks.

COPPERWELD ROBOTICS (con't)

CR50—Microprocessor-based, pneumatically-driven robot with 20# load carrying capacity.

CR10—Microprocessor-based, pneumatically-driven robot with 8# load carrying capacity.

OPTO-SENSE—Machine vision systems incorporating up to eight cameras, used for non-contacting gaging, visual inspection, and part recognition.

OPTO-SENSE MENTOR—One camera machine vision system used in quality inspection systems.

CYBOTECH CORPORATION

Division of Ransburg Corp.

P.O. Box 88514

Indianapolis, IN 46208

Tel: 317/298-5000

Telex: 27464

Contact Person: George Miller

Manager, Applications Engineering

CYBOTECH manufactures and sells a complete line of complete, integrated systems, with application equipment required to do applications using continuous arc welding, and other applications that require continuous-path accuracy. A joint venture of Renault Industries of France and Ransburg Corporation of Indianapolis, we have the support of an excellent and extensive research and development program.

DEVILBISS COMPANY

Industrial Robot Operations

837 Airport Blvd.

Ann Arbor, MI 48104

Tel: 313/668-6765

419/470-2169

Contact Person: William D. Gauthier

Director IRO

Basic design of the U.S. manufactured DeVilbiss/Trallfa TR-3500 robot permits use in a variety of applications ranging from spray painting to welding, and part handling to stapling, and many more. Programming is easily accomplished by either lead through or point to point. Six axis movements and a unique flex arm assure duplication of human motions including wrist roll. A floppy disc memory system allows up to 63 programs and 128 minutes of program time. Worldwide population of Trallfa now exceeds 1000 and U.S. 150.

ESAB NORTH AMERICA, INC.

Robotic Welding Division

1941 Heath Parkway

P.O. Box 2286

Fort Collins, CO 80522

Tel: 303/484-1244

Telex: 910-930-9449

Contact Person: John Farrell

Vice President and General Manager

ESAB is 51% owned by ASEA, both companies headquartered in Sweden with branches in the United States. ASEA manufactures the IRb 6 and IRb 60 industrial robots which ESAB integrates with welding packages and handling system for turn-key installations. ESAB deals only with robotics as it relates to welding applications while ASEA handles other robotic applications.

EXPERT AUTOMATION, INC.

40675 Mound Road

Sterling Heights, MI 48708

Tel: 313/977-0100

Telex: 231120

Contact Person: Heiner Ruf

Vice President

One essential criteria for robots is repeat accuracy which is outstanding on our product. In major installations, interchangeability of individual robots is also of the utmost importance. Each axis of the KUKA robot is "zero-point adjusted" which allows replacement of a unit for maintenance by merely aligning the robot and its control to "exactly zero." No reprogramming is required. Our robots can carry loads up to 220 pounds. The KUKA line of robots is made up of both floor and gantry-mounted models. In addition to our standard robots we offer a wide range of custom designed peripheral equipment such as spot welding guns for robots, turn tables, transfer mechanisms, etc.

FARED ROBOT SYSTEMS, INC.

3860 Revere St.

Suite D

P.O. Box 39268

Denver, CO 80239

Tel: 303/371-5868

Telex: 910-932-0187

Contact Person: Lawrence J. Bruemmer

President

FARED ROBOT SYSTEMS, Inc. is a high-technology robotic applications engineering company. After two decades of robotic

experimentation and development, FARED is leading the robot industry into a new generation of maturity with advanced flexible automation concepts.

FARED creates turn-key, single-source, automation robot systems for the work cell or the complete facility in all industries.

FARED provides evaluation, CAD/CAM analysis, plant surveys, systems consultation, engineering and systems design, testing and run-off, and systems installation, plus training, service, and maintenance for all robotic and flexible automation related applications.

GCA CORPORATION
Industrial Systems Group
One Energy Center
Naperville, IL 60566
Tel: 312/369-2110
Telex: 270567

Contact Person: Mike Lewis
Advertising & Sales Pro. Coord.

GCA offers a total of 21 different models of industrial robots: seven overhead gantry robots and 14 pedestal-mounted models. GCA is staffed to provide robotic systems engineering on a turn-key basis. Our Integrated Manufacturing Systems (IMS) engineers provide the planning, engineering and implementation of Computer Integrated Manufacturing (CIM) systems. GCA's Integrated Factory Controls (IFC) group has developed a state of the art GCA/cimroc robot control, which has the ability to interface with other computer-based factory systems. This group is also developing the GCA/CIMCELL cell controller.

GENERAL ELECTRIC COMPANY
Automation Systems Dept.
P.O. Box 17500
Orlando, FL 32860-7500
Tel: 305/886-2200
Telex: 964209
Contact Person: James A. Meehan
General Manager—Automation
Systems Dept.

General Electric's Automation Systems Department (ASD) provides a full range of services to the user. The two extremes are: full robot systems needs' evaluation, design and implementation; two basic manipulator and controller subsystems, including customer training and post-implementation maintenance services. The system may include intelligent sensors such as vision and

machines not sold by G.E. GE-ASD also provides a full range of vision system products that robot users or robot system houses may use to integrate into a system of their design.

GMFANUC ROBOTICS CORPORATION
Northfield Hills Corporate Ctr.
5600 New King Street
Troy, MI 48098
Tel: 313/492-0897
Telex: 4992691 ITT
Contact Person: James L. Haugen
V.P. Market Planning

GMF Robotics is a joint venture, 50% owned by General Motors, U.S.A., and 50% owned by Fanuc, Japan. GMF manufactures and markets a full line of industrial, multi-axis robots specifically designed for applications such as: machine load/unload, part transfer, assembly, welding, painting, and systems with vision recognition capability. In addition to the list of industrial robots, produced in three separate series, GMF manufactures and markets the highly sophisticated N/C Paint Spray System.

HITACHI AMERICA, LTD.
59 Route 17-S
Allendale, NJ 07401
Tel: 201/825-8000
Telex: 642-734
Contact Person: William A. Mahoney
Marketing Manager

Hitachi manufactures and distributes in the U.S., an extensive line of industrial robots which include Process Robots, Arc-Welding Robots, Spray Paint Robots, and Assembly Robots.

The versatile Process Robot is used for welding, handling parts, assembly, inspection and other manufacturing processes. Total carrying capacity is 22 lbs. Standard features include linear and circular interpolation, weaving, branching, 255 maximum programs and interface functions with peripheral equipment.

The Painting Robot is six axis and hydraulically operated. Vertical and horizontal models are available. Standard features include linear and circular interpolation, easy editing of any portion of programming and independently taught painting speeds.

The Mr. Aros Arc-Welding Robot is a large gantry-type robot with eddy current sensors for gauging the proximity to a workpiece.

HITACHI AMERICA, LTD. (con't)

Applications for this product are for large or long workpieces which require extensive welds.

A full family of Assembly Robots offers a choice in the number of axes and a choice in the weight carrying capability. Controllers for this equipment are manufactured by Hitachi and are state-of-the-art.

Hitachi provides full turn-key service to its customers.

IBM CORPORATION
Advanced Mfg. Systems Dept.
IRD Division
2000 N.W. 51st Street
P.O. Box 1328
Boca Raton, FL 33432
Tel: 305/994-2979

Contact Person: Bruce J. Haupt
Director of Advanced
Manufacturing Systems

The IBM 7535 Manufacturing System is a low-cost, programmable robotic system designed for operations such as automatic assembly and insertion of automotive and electrical parts, multiple-point drilling and tapping, repeatable to plus or minus 0.005 mm (0202 in.), and other high-precision work.

The system consists of a controller with an operator panel and a servo-controlled jointed arm capable of four degrees of freedom.

Multiple IBM 7535's can be programmed with a single IBM Personal Computer, using a version of the AML robotics language developed by IBM called AML/Entry (A Manufacturing Language/Entry).

INOLL, INC.
349 W. Lancaster Ave.
P.O. Box 496
Haverford, PA 19041
Tel: 215/642-4144
Contact Person: W. Nicholas Howley
President

Inoll is a service company. Our specialty is robotics and manufacturing technologies. We are an extension of a manufacturer's management and technical staff. We provide general services: (1) Information services (2) Application evaluations (3) Financial impact studies (4) Short and long term planning (5) Budgeting.

We also offer specific services: (1) System Management (2) System design and specifications (3) Procurement (4) Installation (5) Start up and prove out (6) Post audit of performance vs expectations.

We don't manufacture or represent any machinery manufacturers. We do provide a unique combination of high technology manufacturing services tempered by extensive operating experience from the Chairman/Chief Executive level to the shop floor.

JERVIS B. WEBB COMPANY
Webb Drive
Farmington Hills, MI 48018
Tel: 313/553-1000
Telex: 235226
Contact Person: George Ramsden
Vice President

The Jervis B. Webb Company is the world's largest manufacturer of custom-engineered materials handling systems. The Webb Company's expertise encompasses: standard, power-and-free and enclosed-track overhead and inverted conveyors; overhead cranes and monorails; slat, gull-wing and Towveyor floor conveyors; automatic guided vehicles; roller and belt conveyors; rack storage systems; automated storage/retrieval systems; computer controls; electrical contracting and enclosures; screw and drag conveyors; bucket elevators; forgings and aluminum castings; and automation devices.

KOHOL SYSTEMS, INC.
980 Senate Drive
Dayton, OH 45459
Tel: 513/439-5200
Contact Person: Joseph E. Bockrath
Vice President, Operat.

Kohol Systems, Inc. is an engineering firm located in Dayton, Ohio that specializes in flexible automation systems. Kohol provides a variety of services to industry in the area of flexible automation, including: plant surveys, application studies, economic justification, turnkey robotic systems, support hardware and system peripheral equipment, robot leasing, robot remanufacture, and robotic education.

Kohol offers customers expert assistance for installation of robot automation systems, from the initial design of system to the building and installation of said system in customer facility.

KULICKE & SOFFA INDUSTRIES, INC.

507 Prudential Rd.

Horsham, PA 19044

Tel: 215/674-2800

Telex: 83-4268

Contact Person: Kim Cannon
Marketing Manager

Kulicke & Soffa Industries is a worldwide supplier of automatic assembly equipment for the manufacture of semiconductor devices and circuits, in addition to its standard line of automatic wire and die bonders which include servo controlled pick and place arms.

MACHINE INTELLIGENCE CORPORATION

330 Potrero Avenue

Sunnyvale, CA 95051

Tel: 408/737-7960

Telex: 172778

Contact Person: Barry R. Rapozo
Vice President Marketing

The Model 3030 Intelligent Robot System combines the rugged, reliable Motoman L-3 manipulator with advanced control capability. Its key features are reliability, repeatability, off-line programming and system integration. The ability to integrate with sensors and other factory equipment, coupled with simple setup, enables the system to accomplish tasks cost effectively. The manipulator is a fast and accurate all-electric servo-controlled manipulator, with a robot arm having five degrees of freedom of movement for precision and dexterity. The Model 3030 Controller supports a version of the BASIC language that has been extended to include both vision and robot commands. BASIC programming permits easy interfacing to factory systems with other extensive training. A VS-100 Vision System may optionally be included within the controller, and the robot and vision system may be controlled with a single BASIC program.

MACK CORPORATION

P.O. Box 1756

3695 East Industrial Drive

Flagstaff, AZ 86002

Tel: 602/526-1120

Contact Person: J. Frank Mack, CMfgE
President

The Mack Corporation provides a full product line of grippers, linear transporters and wrist rotators from stock for robotic

service as individual units or combined to provide a full six axis, non-servo B*A*S*E* ROBOT SYSTEM for light duty, bench top parts transfer, assembly and packaging.

Specifications include—payloads to 5 lbs., travels to 12 inches, wrist torques to 10 inch lbs. and repeatability to +.010 inches.

B*A*S*E ROBOTS, SER. II operate on plant air in the non-servo mode with control by electro-mechanical timers, programmable controllers or small computers using explicit instruction programming.

B*A*S*E ROBOTIC COMPONENTS have served industry for over five years and are products of U.S.A.

MICROBOT, INC.

453-H Ravendale Drive

Mountain View, CA 94043

Tel: 415/968-8911

Contact Person: G. W. Rhodes
President

MICROBOT, INC., located in Mountain View, CA., is a manufacturer of low cost, developmental robotic arms and low-cost, light industrial robots. Our products include the MIM-5 (automation and/or robotic assembly, education in robotic principles and control) and the TeachMover (TCM) (designed to simulate industrial robot operations in the laboratory or classroom; it is a completely self-contained unit).

MOBOT CORPORATION

980 Buenos Avenue

San Diego, CA 92110

Tel: 714/275-4300

Contact Person: Lawrence J. Kamm
President

Modular robots. Each MOBOT (TM) is a combination of standard Vectron (TM) motion modules. There are 11 standard rotary motion Vectrons, also of many sizes. Typical configurations are Cartesian rather than polar, with rotation used primarily for orientation change. Each Vectron is driven either by DC servomotor or pneumatic cylinder, as appropriate. Positions are controlled by position markers, part sensors, numerical control, conveyor trackers, and other techniques. Multiple arms are provided as needed. Weight limit is 600 pounds and travel distance is up to 100 feet. Typical configurations are overhead (e.g. like a bridge crane), with no floor obstruction. Control is by program-

MOBOT CORP. (con't)

mable controller, since no computer is needed to synthesize straight line motion from combinations of rotary motions. Grippers are provided.

MTS SYSTEMS CORPORATION

Box 24012

Minneapolis, MN 55424

Tel: 612/937-4080

Telex: 29-0521

Contact Person: Thomas D. Jerney
Division Manager

MTS Systems Corporation manufactures high technology robots and robotic systems. The MTS Model 200A Industrial Robot is a heavy duty unit with four, five or six degrees of freedom. High performance motion control is provided by MTS' advanced servo-hydraulic controls.

MTS robots are suitable for materials handling, machine loading/unloading, tool handling, inspection, and non-conventional manufacturing applications requiring advanced control capability.

The MTS Model 200A Robot is a jointed-arm design with 220 lbs. capacity, a 74 inch reach and 120 degrees/second maximum sweep velocity. The robot control system uses the DEC LSI 11/23 processor.

MTS maintains a broad network of sales and service offices worldwide.

NORDSON CORPORATION

Robotic Division

4937 Mills Industrial Parkway

North Ridgeville, OH 44039

Tel: 216/988-9411

Contact Person: Anthony H. Clarke
Marketing Manager

Basic components of the Nordson Robot System include a programming arm, an electric solid-state control unit, a manipulator arm, and a hydraulic power pack. They are designed for automatic finishing operations.

The Electronic Control Console

Features include:

- A self-diagnostic "troubleshooting circuit."
- Capability of being linked directly into a central computer for virtually infinite programming capacity.
- Synchronization to the conveyor line.

- Fan suppression capability which enables the operator to modify the fan pattern of the spray gun at any given time during the program.

- On-line and off-line programming editing.

The manipulator has six degrees of freedom and is powered by high torque rotary actuators. The use of rotary actuators ensures a totally enclosed and self-lubricating structure minimally affected by environmental conditions.

The robot system that is purchased from Nordson is designed by a team of application engineers to suit the requirements of the customer's specific application. Engineers will be on hand prior to and during installation of the robot system.

Training Programs

The Nordson Robotics facility is equipped to conduct customer training programs. These programs are tailored to the customer's installation and are designed to provide the important initial training for production, maintenance and management personnel.

NOVA ROBOTICS INC.

265 Prestige Park Road

E. Hartford, CT 06108

Tel: 203/528-9861

Contact Person: John M. Evans
President

The Nova ARIES robot system is a programmable, all-electric, modular, gantry-type constructed from rugged, high-grade, machine-tool type components. The state-of-the-art control system is designed and built to integrate effectively into the manufacturing process.

The robot is easily programmed in any one of three ways. Load-and-go, teach mode, or a choice of two higher level programming languages make the system simple and versatile. Full RS-274D standard numerical control commands are accepted by the system for compatibility with NC and CAD/CAM programming systems, and Nova's ASTRO language contains advanced features for sensor based adaptive control.

PRAB ROBOTS, INC.

6007 Sprinkle Road
P.O. Box 2121

Kalamazoo, MI 49003

Tel: 616/329-0835

Telex: 224468

Contact Person: Walter K. Weisel
President

Prab manufactures 8 models of industrial robots, offering unparalleled flexibility of design and application. Prab Robots, with weight handling capabilities of ounces to one ton, cover a spectrum of potential applications throughout the industrial manufacturing field, such as machine loading, spot welding, injection mold unloading, die casting, forging, parts transfer, and palletizing. Additionally, each model incorporates features allowing for further "tailoring" to fit particular application requirements. With one of the largest installed robot bases of any robot manufacturer, Prab is well equipped to design robots which are flexible, reliable, and cost-effective.

PRODUCTIVITY SYSTEMS INC.

21999 Farmington Road
Farmington, MI 48024

Tel: 313/474-5454

Contact Person: William R. Tanner
President

Productivity Systems Inc. (PSI) is a consulting and engineering organization providing assistance to industry in implementing industrial robots and special-purpose automation to improve productivity and solve manufacturing problems.

Productivity Systems Inc. provides a complete range of services from survey to system start-up, including:

- Initial surveys of manufacturing operations to identify potential applications for industrial robots and special-purpose automation.
- Analysis of technical and economic feasibility.
- Systems development and equipment specification.
- Concept development and system engineering.
- Design of robot tooling, automation, support facilities and system interfacing.

- Fabrication, try-out, system installation supervision and start-up assistance.

In addition, Productivity Systems Inc. performs market studies, concept developments and product evaluations for current and future manufacturers and distributors of industrial robots and related equipment. PSI also conducts public and private robotics seminars and workshops.

REIS MACHINES

1426 Davis Road

Elgin, IL 60120

Tel: 312/741-9500

Telex: 910 251 4481

Contact Person: Juergen E. Mader
General Manager

The multifaceted, all electric REIS robot line features three (soon to be four) distinct models ranging in load capacities from 35 lbs. to 110 lbs. While covering the floor space of only one worker these rugged units are also fast, accurate, and clean. Used for a variety of tasks such as machine load/unload, spot and arc welding, palletizing, and material handling, REIS robots cover a broad spectrum of applications and are very reasonably priced.

ROBOT SYSTEMS INC.

110 Technology Parkway

Technology Parkway

Technology Parkway/Atlanta
Norcross, GA 30092

Tel: 404/448-6700

Contact Person: Lester V. Ottinger
President

ROBOT SYSTEMS INC. (RSI) designs, builds, and installs robot systems and also implements automated manufacturing facilities. RSI has a fully equipped machine shop and machinery design group for the design and build of end-of-arm tooling as well as special-purpose devices for turnkey robot systems provided by the company. RSI provides a full production-scale runoff at its Atlanta Headquarters for all turnkey systems.

RSI has an extensive robotics laboratory containing many commercially available robots which are used in educational seminars and application demonstrations for clients.

SEIKO INSTRUMENTS U.S.A. INC.
2990 W. Lomita Blvd.
Torrance, CA 90505
Tel: 213/530-3400
Telex: 910-347-7307
Contact Person: Samuel Kory
Director Marketing

High precision, high speed, high performance mini-robots for small parts automation.

Two Model Series:

(I) Precision, Point-to-Point Nori Servo (4 Models)

(II) Precision, Point-to-Point Simultaneous Servo (Introduction Fall 1982)

Applications: (1) loading/unloading, (2) assembly, (3) materials handling, (4) palletizing, (5) inspection systems

STERLING DETROIT COMPANY
261 E. Goldengate Avenue
Detroit, MI 48203
Tel: 313/366-3500
Contact Person: James B. Canner
Vice President

Sterling Detroit builds simplified robots and total robotic systems.

Complete "in-house" engineering and manufacturing facilities can provide robotic customers with the opportunity for "turnkey" manufacturing solutions to meet individual production requirements.

Sterling robots and robotic systems have been used for die casting, forging, machine tool loading/unloading, parts transfer, and plastic molding.

A worldwide network of professional application engineers and technicians are available to support customer requirements.

THERMWOOD CORPORATION
P.O. Box 436
Dale, IN 47523
Tel: 812/937-4476
Contact Person: Ken J. Susnjara
President

Thermwood Corporation designs and manufactures high technology robots and computer controlled machine tools. Included are:

"CARTESIAN 5" heavy-duty, automated machining centers route, cut, drill, shape and bore a variety of materials including wood, plastic, non-ferrous metals, and even some

of the super materials such as graphite and keylar. Standard work tables up to 30 feet and up to seven-axes capability are available.

"PAINTMISER" is a continuous-path, lead-through-teach robot designed for spray painting. Its control system stores up to 8 programs or, with an optional disc memory, up to 5 hours of programming time.

"TASKHANDLER 25" is a continuous-path material handling robot featuring lead-through teach. It has a 25 pound load capacity.

TOWA CORPORATION OF AMERICA
1711 S. Pennsylvania Avenue
Morrisville, PA 19067
Tel: 215/295-8103
Telex: 843484 TOWAMORIS
Contact Person: Frank F. Kawase
Vice President

We manufacture and sell the following machines:

TRANSMAN: A compact and powerful (up to 120 lbs payload) industrial robot, ideal for loading, unloading, palletizing, and depalletizing with programmable controller. Wide variety in models, installation, and attachments.

Y-MAN: A material handling machine filling the gap between manual work and industrial robot. Electronically controlled unique manipulator can provide 3-dimensional movements in gravity-free ways.

UNIMATION INC.
Shelter Rock Lane
Danbury, CT 06810
Tel: 203/744-1800
Telex: 969612
Contact Person: Stanley J. Polcyn
Senior Vice President

UNIMATION Incorporated, a Westinghouse Company, is the leader in the field of robotics and was first to introduce practical robots to the industrial scene. Since its first installation, the company has continued to pace the field with state-of-the-art robotic technology.

In addition to a broad line of robot models, the company provides a range of capabilities from factory automation feasibility studies through complete system design, engineering, installation, maintenance and training.

UNITED STATES ROBOTS

650 Park Avenue
King of Prussia, PA 19406
Tel: 215/768-9210
Contact Person: George S. Crosby
President

United States Robots manufactures a line of microprocessor-based electric assembly robots and robot systems. The Maker Robot family features a sophisticated but easy-to-use programming system. Other features include: modular controls for the simple addition of "Intelligent" peripherals (such as vision); modular mechanics for simple maintenance; a unique telescoping joint; non-volatile memory.

United States Robots also provides complete service, applications and systems support.

UNITED TECHNOLOGIES CORPORATION

Essex Group, Inc.
Steelweld Robotic Systems
Automotive Products Division
5200 Auto Club Drive
Dearborn, MI 48126
Tel: 313/593-9500
Contact Person: Robert Huehner
V.P. & General Manager

Steelweld Robotic Systems is a unit within United Technologies' Automotive Group.

In Europe, Steelweld is a major supplier of turnkey manufacturing systems. In the U.S., Steelweld is manufacturing and marketing turnkey systems and Niko robots, such as:

Niko Articulated Arm Robots
Niko Gantry Mounted Robots

All models feature electric drives and harmonic gears. None require special foundations, and floorspace requirements are minimal.

Other products include:

Hemming and Welding Lines
Hyper Compact Resistance Welding Units
Welding and Furnace Cables

UNIVERSAL INSTRUMENTS CORPORATION

Product Development
P.O. Box 825
Binghamton, NY 13902
Tel: 607/775-1102
Contact Person: D. W. Ackerman
V.P. Product Development

Universal Instruments provides turnkey robotic stations for the insertion of non-standard components in P.C. board assembly. The basic manipulator is a five axis cartesian axis robotic positioning system. Options include material handling conveyor modules, component input feeders and various end effect tooling. A multi-robot control is provided with multiple program storage, program generation and editing, system diagnostics, and management information.

WEAR CONTROL TECHNOLOGY, INC.

189-15 Station Road
Flushing, NY 11358
Tel: 212/762-4040
Contact Person: Paul A. Kammer
Vice President & General Manager

Wear Control Technology, Inc. designs, manufactures and markets automated systems for protective coating with welding and spraying processes such as plasma transferred arc welding, combustion spraying and plasma spraying. Coatings applied with these systems include metals, ceramics and carbides.

RIA Accessory Equipment Suppliers

ABEX CORPORATION

530 5th Avenue

New York, NY 10036

Tel: 212/560-3200

Telex: 126605

Contact Person: G. O'Brien

Robotics Manager

Abex Corporation's various divisions supply the following robotics related components:

Hydraulic Components—

servovalves of the jet pipe type (Aerospace Div.)

valves—directional, pressure, flow, etc. (Denison Div.)

pumps—vane, variable of fixed piston (Denison Div.)

motors—vane and piston (Denison Div.)

power units (Denison Div.)

Pneumatic Components (Mead Div.)

valves

cylinders

accessories

Friction materials for brakes, and control systems (Friction Prods. Div.)

Castings

special alloy castings (low weight, high strength, etc.)

special gears and bearings (Castings Div.)

APPLICATION ENGINEERING CORPORATION

801 AEC Drive

Wood Dale, IL 60191

Tel: 312/595-1060

Telex: 910-222-0219

Contact Person: Michael A. Waters

Application Engineering Corporation is the exclusive representative in the United States and Canada for Harmo Company, a manufacturer of robots and step feed conveyors. AEC provides sales, leasing installation and service for all equipment. AEC Harmo robots are designed specifically for the removal of parts from injection molding machines. Pneumatic step feed conveyors index the belt once each machine cycle tying in well with automation systems. Standard

end of arm tooling is sold individually or designed and constructed per customer requirements. Tooling components include suction cups, mini air cylinders, mini grippers and mini air nippers.

A.S.R. SERVOTRON INC.

2750 Oregon Court

Building M

Torrance, CA 90503

Tel: (213) 320-8931

Telex: 182478

Contact Person: Robert W. Ferran

V.P. of Sales

A.S.R. Servotron is a worldwide manufacturer of PWM transistor servodrivers, D.C. permanent magnet servomotors and microprocessor-based positioning systems.

With manufacturing facilities in the U.S.A., Germany, Switzerland, and England, A.S.R. Servotron provides technologically advanced servosystems and components for a broad range of applications, including robotics, automation machinery, process machinery, antenna drives and machine tools.

PWM transistor servodrivers are offered with continuous current ratings ranging from 4 to 90 amperes, up to 200 VDC. Peak current ratings range from 2 to 3 times continuous ratings. Multi-axes systems can be furnished 19+ rack or panel mount configurations. Totally enclosed single axis systems are also available.

D.C. permanent magnet motors are offered with continuous stall torques ranging from 6 lb-in to 1,920 lb-in.

The PCS-100 microprocessor-based control system is an expandable, modular, system that can control up to 32 axes of DC and/or AC drives simultaneously.

ASTEK ENGINEERING INC.

5 Bridge Street

P.O. Box 7201

Watertown, MA 02172

Tel: 617-924-2929

Contact Person: Sergio Simunovic
President

Astek Engineering, Inc. manufactures a standard line of remote-center compliances, pneumatic grippers, and 6-axis force sensors for use on robots in assembly operations.

The compliances are available in a variety of sizes, for use in any operation where a controlled amount of lateral and rotational float would aid in the assembly of close-fitting parts.

The force sensors are fully integrated units, containing the transducer structure and processing electronics to provide six full axes of precision force measurement for monitoring and analysis of assembly operations.

ATCHLEY CONTROLS INC.
6933 Eton Avenue
Canoga Park, CA 91303
Tel: (213) 346-3500
Contact Person: Raymond Atchley
President

We manufacture a complete line of electro hydraulic and electro pneumatic servo valves. These components control the hydraulic actuators and motors that position the robot axes. Electrical signals from the computer robot control systems activate the servo valves which in turn control the high pressure hydraulics and pneumatics connected to the actuators.

BALLUFF, INC.
8054 Production Avenue
P.O. Box 937
Florence, KY 41042
Tel: (606) 727-2200
Telex: 24-1932
Contact Person: John Goyer
Vice President/General Manager

Balluff, Inc., is a leading manufacturer of proximity, opto, and mechanical sensing devices for automation.

Products include a full line of proximity and opto sensors with special high flex wire for the constant flexing motion of robots.

A new complete line of "shorty" proximity sensors are designed specifically for robot applications.

For flexible manufacturing systems, products are available for pallet, tool and fixture coding for non-contact identity recognition.

Specially designed sensors are also available for unique application requirements.

BARRY WRIGHT CORPORATION
Industrial & Aero Products Group
700 Pleasant Street
Watertown, MA 02172
Tel: (617) 864-2456
Telex: 710-327-1290
Contact Person: Charles M. Salerno
Vice President

*THE INDUSTRIAL AND AERO PRODUCTS
GROUP OF THE BARRY WRIGHT CORPORATION*

IAPG manufactures components and accessories for industrial robots and manufacturing systems including: Barrymount shock and vibration isolators to protect sensitive equipment; power transmission couplings featuring zero backlash and protection from sideloads; air silencers for a quiet environment; Parajust Motor Speed Controls; Rohlix Linear actuators to convert rotary motion to linear motion on a smooth shaft; power clamping to hold work in progress firmly and uniformly; machinery mounts; and pneumatic isolation systems.

BEI ELECTRONICS, INC.
681 Market Street
Suite 741
San Francisco, CA 94105
Tel: 415/974-1275
Contact Person: Neal Hinkle
Vice President

Optical absolute and incremental encoders for precise measurement of position and rate; Ultra-Loc precision D.C. Servo drive systems, up to 220 positions per turn and rate range of 32,000 in one digit steps. All computer controlled by customer, host computer or BEI microprocessor controller; multi-turn absolute shaft encoders.

BIRD-JOHNSON COMPANY

Fluid Power Division
110 Norfolk Street
Walpole, MA 02081
Tel: 617/668-9610
Texex: 68-17-269
Contact Person: C. H. Pingree
Manager-Marketing Services

Our products are Hydroac Vane Type Rotary Actuators and hydrowrists. They are both hydraulically driven and are used on hydraulic robots to provide the motion at the axes. Hydrowrist is a 3 axis module consisting of 3 hydroacs and it provides 3 axes of motion in one package.

DATA INSTRUMENTS

Wintriss Controls Group
4 Hartwell Place
Lexington, MA 02173
Tel: 617/861-7450
Contact Person: Roberta Nelson
Application Engineer

Data Instruments manufactures the Shadow infrared presence-sensing device for personnel protection around hazardous robot systems. The Shadow provides an invisible light curtain that shields personnel (operators and passersby) from the moving, hazardous point-of-operation that a robot presents. One transmitter and one receiver are floor—or equipment-mounted. When used with special Shadow mirrors, the device forms an economical, protective, invisible curtain around the robot and its work area. The Shadow's rugged construction permits its use even in the most demanding environment. D.I. designs/manufactures pressure and force transducers that meet general applications and critical applications; high pressure, media compatibility, high output, and even frequency input. Also, D.I. has developed a tactile sensor for robots. Applications Engineers at the factory can answer questions, make recommendations, and suggest options to meet each user's needs.

EATON CORPORATION/SYNFLEX PRODUCTS

Main & Orchard Streets
Mantua, OH 44255
Tel: 216/274-3171
Telex: 810 437 2430
Contact Person: William Phipps
Product Manager

Eaton's product line, represented by the brand name "Synflex", represents the widely accepted thermoplastic hydraulic hose for use in robot applications. Synflex hydraulic hose offers the robot manufacturers/users the following benefits in its product: lightweight, flexible, extremely clean.

The Synflex hydraulic hose line features 100R7 and 100R8 hydraulic hoses with operating pressures from 1000 to 5000 psi. The ID range is from 3/16" through 1".

HARMONIC DRIVE DIVISION OF EMHART

51 Armory Street
Wakefield, MA 01880
Tel: 617/245-7802
Telex: 94-9442
Contact Person: J. D. Stoehr
Sales Manager

A manufacturer of compact, in-line, low and zero backlash reduction gearing used wherever precision movement and/or accurate positioning is needed; especially if in a small envelope. Sizes range from 1 in P.D., 20 in lb. output torque to 10 in. P.D., 150,000 in. lb. output torque with single stage ratios from 50:1 to 320:1.

Also a manufacturer of stepping motors integrating above gearing for accurate positioning (up to 4000 steps/rev. without ministepping) and having extremely low inertia.

INDUSTRIAL DRIVES DIVISION OF KOLLMORGEN CORPORATION

201 Rock Road
Radford, VA 24141
Tel: 703/639-2495
Telex: 710-875-3743
Contact Person: Paul Fowler
Market Dev. Engineer

The Industrial Drives Division of Kollmorgen Corporation (IDD) manufactures AC and DC servo motors and their associated drives.

IDD is the technological leader in Rare Earth (Samarium Cobalt) motor design. Because of the high flux density of rare earth magnet materials, these motors exhibit excellent torque/weight and torque/volume ratios. These motors are ideal candidates for robotics and other applications where weight and volume are at a premium. IDD produces five lines of Rare Earth motors ranging from

35 oz.in. to 35 lb.ft. of continuous torque capability TENV.

IDD also manufactures synchronous (Brushless DC) motors and controllers from 1.2 lb.ft. to 35 lb.ft. continuous, TENV. As well as excellent torque/weight and torque/volume ratios, these motors also provide the highest possible horsepower/weight ratios. These are truly "state of the art" servos for robotics and hazardous environments such as underwater applications.

IDD's 10 thru 30 horsepower line of VFAC drives and induction motors are now ready for the most demanding applications in the harshest environments.

JAVELIN ELECTRONICS, INC.
19831 Magellan Drive
Torrance, CA 90502
Tel: 213/327-7440
Telex: 19-4860
Contact Person: Donald T. Heckel
President

We manufacture B/W and color solid state cameras for robotic vision and automation uses. Both cameras are built around a CMOS chip with 485 vertical x 384 horizontal pixels on a matrix array. These two cameras are built with industry in mind. Solid state cameras eliminate lag, trailing or blooming in the picture and are virtually burn-proof. Also available are a 13 inch high-resolution color monitor and a complete line of B/W monitors, lenses, macro-lenses and other accessories.

KENNAMETAL
P.O. Box 231
Latrobe, PA 15650
Tel: 412/539-5066
Telex: 510 4687277
Contact Person: F. M. Herko
Senior Engineer

Accessory Group participation is to support internal Manufacturing Technology Programs in Robotics and to identify Machine Tool/Robot Interface problems. No product or service related to robotics is available.

MAVILOR MOTORS
285 Murphy Road
Hartford, CT 06114
Tel: 203/525-7743
Telex: 96-6469 NEPCO HFD
Contact Person: Carl M. Fink
President

The Mavilor motor is a low-inertia, permanent magnet DC disc motor with a wound armature of copper magnet wire molded with epoxy resin into a dish shape.

The motors range in size from 1/5 to 16 HP and are available with: tachometer; brakes; encoders; gear reducers; and companion Infranor PWM transistorized servo-amplifiers, especially designed to optimize motor performance.

The motor's high performance/low-inertia make it ideally suited for electric robots.

MICRON INSTRUMENT CORPORATION
210 Express Street
Plainview, NY 11803
Tel: 516/349-1200
Telex: TWX 5102212194
Contact Person: Ted Moser
President

Micron designs and manufactures the following servo products for robots:

- 1) Position Transducers—Resolver (Analog)
Position Transducers—Encoder (Digital)
- 2) Rate Transducers—Tachometer D.C.
- 3) Manual Pulse Generators—Analog and Digital
- 4) Programmable Limit Switches
- 5) Hi-Torque Gear Actuators
- 6) Flexible Couplings
- 7) Accessory Items
- 8) Over-Load Couplings
- 9) All of the above items combined into one assembly which include D.C. Servo Motor, hi-torque gear actuator, position transducer (resolver or encoder), programmable limit switches for end limits and home position.

MOOG INC.
Industrial Controls Group
East Aurora, NY 14052
Tel: 716/652-2000
Telex: 91-9144
Contact Person: Daniel C. Clark
President

Moog Inc. manufactures and markets a complete line of electrohydraulic servovalves and related electronic control components used worldwide by many robot manufacturers for precise motion control. Manufacturing and/or service facilities are available in nine countries as well as the United States. Intrinsically safe models are approved for paint spraying applications.

OBJECT RECOGNITION SYSTEMS, INC.

521 Fifth Avenue

17th Floor

New York, NY 10017

Tel: 212/682-3535

Contact Person: John W. Artley, President

Fritz Lyon, PR Contact 212/980-9120

ORS offers a family of machine vision systems that can be used with robots. The ScanSystem Model 200 employs three image processing strategies, one or more of which can be selected for use to examine an object for inspection, verification or identification purposes before proceeding with a robotic operation.

The i-bot 1 vision module has been designed specifically to feed the X, Y, and Theta data back to a robot to permit it to remove a single object from a jumbled bin of parts.

ORS also offers parallel jaw grippers with complementary proximity, presence and force sensors to assist in the removal of objects from a bin.

**PEGASUS DIVISION
KUEHRING COMPANY**

2890 John R. Road

Troy, MI 48084

Tel: 313/689-9000

Telex: 810-232-1529

Contact Person: John R. Lipscomb

Director of Marketing

Pegasus is an international supplier of precision electrohydraulic industrial servovalves, actuators and servo system control electronics. In addition to a complete line of standard industrial servovalves, Pegasus offers special servovalve product lines tailored to robot applications. The robot series servovalves offer superior contamination resistance with performance characteristics designed specifically for robot applications. The intrinsically safe, low power servovalves are available for all hazardous applications where "explosion proof" and other safety systems do not provide sufficient protection.

The Pegasus servo system engineering capability is a proven source of technical knowledge and application experience available for custom engineered control systems and application problem solving services.

PHD, INC.

Airport & Piper Drive

P.O. Box 9070

Ft. Wayne, IN 46899

Tel: 219/747-6151

Telex: 23-261.1

Contact Person: Gunnar Grotness

President

Manufacture air and market hydraulic actuators, hydraulic manifolds, check valves and motion control valves under brand names of:

- Tom Thumb & PHD
- Small bore cylinders
- Rotary Actuators
- Nonrotating cylinders
- Grippers
- Partshandlers
- Multimotion actuators
(a combination of programmable linear and rotary motion)
- Reed and Hall effect position sensors available on all products.
- Design and manufacture special related products for OEM and user customers.

**PMI MOTORS DIVISION/KOLLMORGEN
CORPORATION**

5 Aerial Way

Syosset, NY 11791

Tel: 516/938-8000

Telex: 510-221-1875

Contact Person: John Calpena

President

PMI Motors manufactures the unique, high-performance ServoDisc DC motor featuring the ironless disc armature. ServoDisc motors range in output power from 1/17 to 10 hp and output torque from 19 oz-in to 17 lb-ft. ServoDisc motors are available with electric brakes, analog tachometers, optical encoders or resolvers.

PMI Motors also offers a complete line of single and multi-axis PWM card amplifiers and MicroMotion and MultiMotion digital positioning drives for complete positioning capability in robot and specialty automation applications.

PRODUCTION EQUIPMENT COMPANY

The Robot Support Group
401 Liberty Street
Meriden, CT 06450
Tel: 203/237-5030
Contact Person: Gordon Davis
General Manager

As a robot accessory supplier, we are currently involved in the following areas: consulting on systems; designers and manufacturers of special parts feeding equipment; robot hand tooling; sensors & controls; designing and supplying entire "turn-key" systems.

SI HANDLING SYSTEMS, INC.

P.O. Box 70
Kesslersville Road
Easton, PA 18042
Tel: 215/252-7321
Telex: 847483
Contact Person: Sara Jane Bensinger
Marketing Services Coordinator

SI is the leader in supplying automated transportation systems for use in flexible manufacturing systems. SI sells these systems to end users and to system integrating contractors. SI assists in designing systems which interface to a wide variety of robotic and manufacturing stations with automated storage systems. SI will control, track and continuously identify all material in an FMS automated transportation system, storage system and in FMS work stations. SI will supply real time status to customer host computer systems and supply signals to robots or other manufacturing stations to indicate correct delivery and positioning of materials allowing manufacturing work to be performed.

SYSTEM CONTROLS, INC.

4901 First Avenue, South
P.O. Box 11063
Birmingham, AL 35202
Tel: 205/591-8655
Contact Person: John W. Rainsay
President

Electrical control system design and manufacture.



Survey Respondents

AUSTRALIA

Dr. Yow-Lam Oh
Head, Department of
Robotics
Caulfield Institute of
Technology
900 Dandenong Road
P.O. Box 197
Caulfield East
Victoria, 3145
Australia

Michael Kassler
Convener Steering Committee
Australian Robot Association
McMahons Point NSW 2060
Australia

AUSTRIA

Feichtl Roland
Manager Industrial Robots
Voest Alpine
A-4020 Linz
Postf.2 Australia

BELGIUM

Frank Deris
President
BIRA-Robotica National
Coordinator
FN-Robotics
Ravenstein 60
Brussels 1000 Belgium

CANADA

Michel Blouin
Engineer
Centre De Recherche
Industrielle Du Quebec
333 Franquet Ste Foy
Quebec Canada G1V 4C7

Yuri Blanarovich, M. Sc., P. Eng.
President
Blanarovich Engineering
Box 65, Don Mills Ontario, Canada M3C 2R6

CZECHOSLOVAKIA

Prof. Ing. J Buda
Facility of Mec. Engineering
Technical University
04187 Kosice, Svermova 9
Czechoslovakia

DENMARK

Holger Knudsen
Chairman
Danish Robot Association
ASEA
Pettersmindevej 1
5000 Odense C

FINLAND

Dr. Antti Niemi
Research Professor
Technical Research Centre of Finland
VTT/SAH, Otakaari 5 I
SF-02150 ESPOO 15, Finland

FRANCE

Michel Parent
Charge de Mission
Agence de l'Informatique
Cedex 16
92084 Paris la DeFense
France

GERMANY

Hans-Jurgen Warnecke
Prof. Dr-Ing.
Institute fur Produktionstechnik
und Automatisierung
Nobelstr. 12, 7000 Stuttgart 80
West Germany

ITALY

Prof. Daniele Fabrizi
President
Societa Italiana Robtics Industriale
c/o Etas Kompass Via Mantegna 6
20124 Milano, Italy

JAPAN

Prof. K. Yonemoto
Executive Director
Japan Industrial Robot Association
C/O Kikaishinko Bldg.
3-5-8 Shibakoen
Minato-Ku
Tokyo, Japan

KOREA

Bong Jim Lee
Director
Korea Advanced Institute
of Science & Technology
P.O. Box 131 Dongdaemun
Seoul, Korea

NETHERLANDS

Dr. J. B. Eijlers
Director
Meininger Automation b.v.
Polakweg 6 2288 GE Rijswijk
Netherlands

POLAND

Prof. A. Morecki
Technical University of Warsaw
Al. Niepodleglosci 222
ap 00-663 Warszawa, Poland

SINGAPORE

Steve Choo
Chairman
Singapore Robotic Association
5, Portsdown Road
0513 Singapore

SWEDEN

Dr. A. Armstrong
I.V.F. Swedish Institute for Production
Engineering Research
S-10044 Stockholm, Sweden

Karl M. Haugen
Product Manager
Atlas Copco Tools AB
P.O. Box 31510
S-104 82 Stockholm
Sweden

Prof. Nils Martensson
Institut of Tech.
Dept. of Mech. Engineering,
Production Engineering
S-58183 Linköping,
Sweden

SWITZERLAND

C. Marchindo
Ecole Polytechnique Federale
De Lausanne Institut de
Microtechnique
1015 Lausanne Switzerland

UNITED KINGDOM

Prof. Alan Pugh
University of Hull
Dept. of Electrical Engineering
Hull HU6 7RX
United Kingdom

T. E. Brock
British Robot Association
35-39 High Street
Kempston, Bedford MK42 7BT
United Kingdom

UNITED STATES

Donald A. Vincent
Executive Vice President
Robot Institute of America
P.O. Box 1366
Dearborn, MI 48121 USA

RIA Executive Committee and Board of
Directors
RIA Membership

Laura Conigliaro
Vice President
Prudential Bache
100 Gold Street
New York, NY 10292